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The information given in this document is not to be communicated, either directly or indirectly, to the Press or to any person not authorised to receive it.

6-ft. WADING INSTRUCTIONS

for the

SHERMAN III

(Med. M 4A2)

CHILWELL
CAT. NO. **72/571**

NOTE

The schedule of parts listed in this publication is up to date at the time of printing. Differences between these printed lists and stores received, resulting from amendments, will be indicated on the printed vouchers received with the stores.

P. P. & E., Chilwell.

This publication has been produced to the instructions of the Chief Inspector of Fighting Vehicles, to whom all communications should be addressed.

This Edition entirely supersedes the First Edition, Chilwell Cat. No. 72/398

Second Edition

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**Second Edition
March 1944**

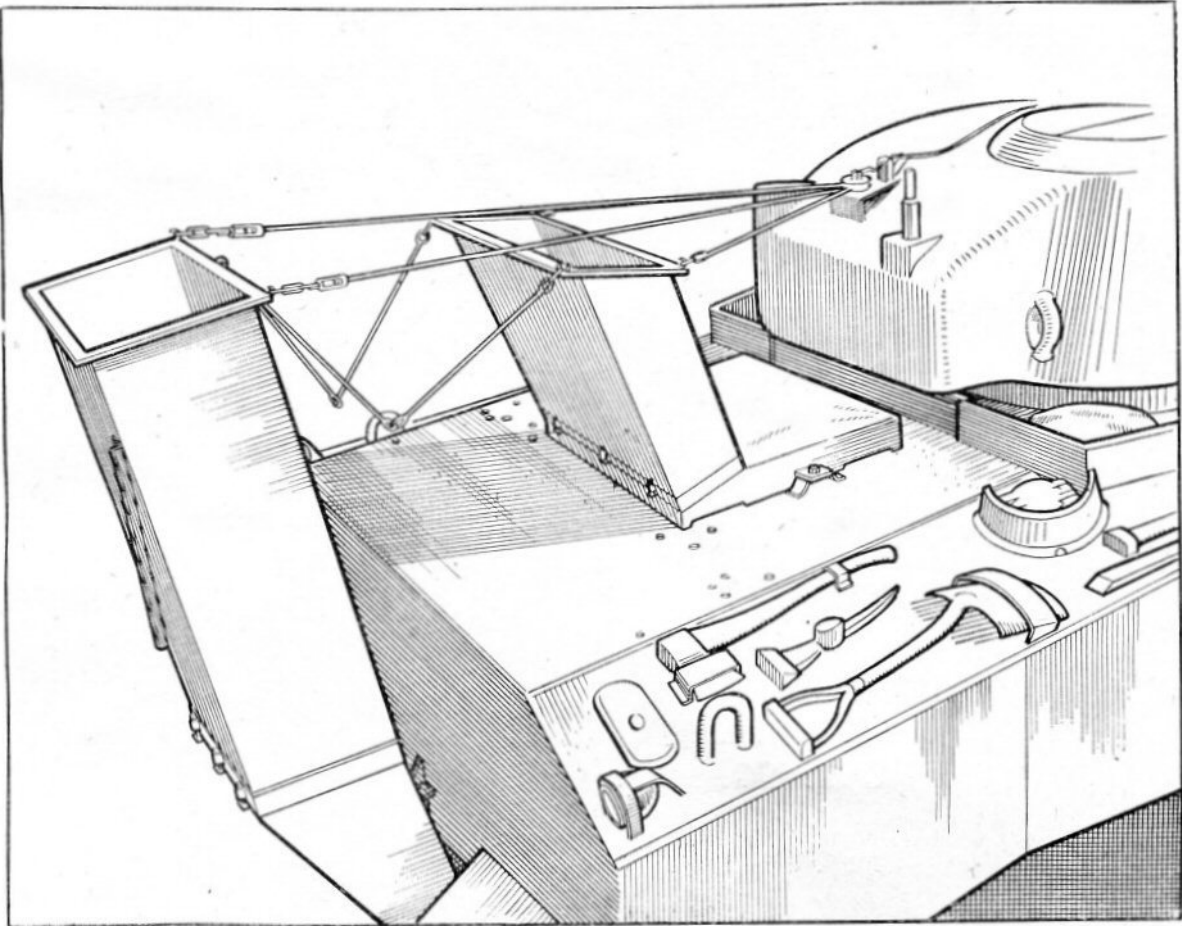


Fig. 1. SHERMAN III WITH HARDWARE FITTED

FOREWORD

By working to the instructions in this book, the Sherman III can be prepared for wading through water up to 6 ft. deep. The method adopted is to make the hull watertight by using certain sealing compounds, and to extend the air inlet and exit openings above the waterline, by means of hardware which can be jettisoned after wading. See Figs. 1 and 18.

On landing, the vehicle can be put into fighting trim without any member of the crew exposing himself.

The preparation of the vehicle is designed to be carried out by the crew, except for items which require the services of a fitter. In Chapter I, the various materials used are described, and in Chapter II the stores required are listed.

Wading must be a 100 per cent. successful operation.

In addition to these stores, material, such as sleepers, will be required for constructing a ramp on which to raise the vehicle while working on the bottom plate. Also needed is an issue of one gallon of petrol per vehicle for cleaning purposes. An order to seal vehicles should automatically confer authority for the issue of the necessary quantity of petrol, and for the loan from Unit equipment of stirrup pumps to facilitate cleaning.

Before sealing :—

- (a) The vehicle *must* be in first class mechanical condition.
- (b) The vehicle *must* have been modified by the manufacturers or by Army Workshops to D.M.E. Circular No. A1158.

A vehicle already modified in accordance with this circular will have been equipped with the necessary fittings for the "hardware." Action affecting instruments should also have been taken under D.M.E. workshop bulletin No. FC21 dated 19.12.42.

Note.—*Any vehicle which has not been modified cannot be sealed.*

A detachable "Task Card" is incorporated with the back cover, and each item should be initialed by the officer i/c of sealing after he has satisfied himself that the task is correctly completed.

SUPERVISION IS VITAL.

An officer must be detailed to supervise sealing, and to be responsible for passing all work as satisfactory. Advice on supervision is given in Chapter I.

APPROXIMATE MAN-HOURS PER STAGE

							Crew	Fitters
Stage 1	..	..	..	..	..	..	211*	10
Stage 2	..	..	..	..	..	..	33	—
Stage 3	..	..	..	..	..	..	8	—

*Included in Stage 1 are 22 man-hours expended in freshwater immersion tests involving road work of 14 miles.

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16. Sealing horn	36. Sealing fire extinguisher handle.
17. Air exit chute fastening.	37. Filler cap covers.
18. Diagram of hardware.	38. Sealing vizor.
19. Diagram of wiring harness.	39. Sealing periscopes.
20. Cordtex on co-driver's machine gun.	40. Hatch sealing (open).
	41. Hatch sealing (closed).

In the illustrations, sealing materials are identified by the colours shown below :—



(RED) Bostik
(see Text)



(ORANGE) Boscoprene



(BROWN) Asbestos Compound



(GREEN) Grease
or Lanolin



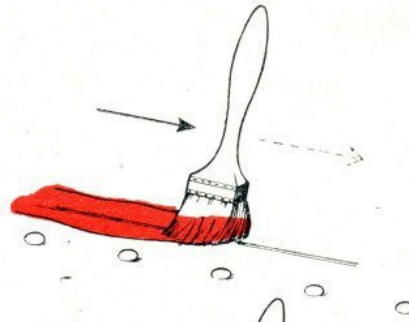
(STONE) W.D. Pressure Plastic



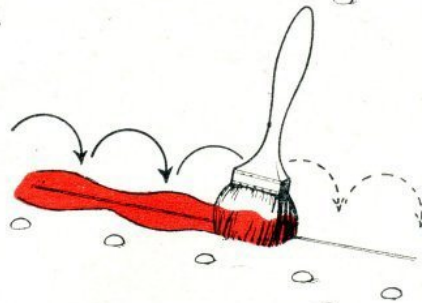
(GREY) Fabric

APPLYING BOSTIK A.A.

DON'T STREAK IT ON,
THIS WON'T FILL THE SEAM.



DON'T DAB IT ON
EITHER.



DO BRUSH FIRMLY
WITH A ROTARY MOVEMENT
CROSSING THE SEAM.
REMEMBER IT IS THE SEAM
THAT NEEDS TO BE FILLED
WITH BOSTIK. KEEP THE
BOSTIK WORKABLE BY
STIRRING WELL & WARMING
IF NECESSARY.

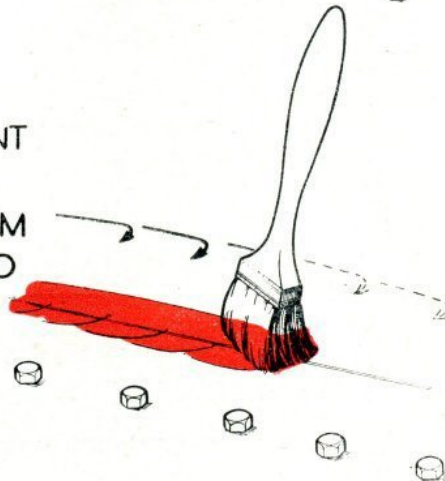


Fig. 2.

CHAPTER I

MATERIALS AND THEIR USES

CLEANLINESS IS THE FIRST ESSENTIAL OF successful sealing.

Mud, oil, grease and water will each spoil adhesion of the sealing compounds.

Whenever work is taking place on sealing during wet weather, efficient cover must be arranged over the vehicle.

A. CLEANING MATERIALS

For cleaning, the following are used :—

Scraper or Wire Brush for removing caked mud, loose paint, etc., that water will not shift

Clean Rag or Cotton Waste for wiping down after washing, or with petrol or Bostik cleaner.

Petrol is used for the preliminary cleaning of all oily surfaces. After using petrol finish off with Bostik cleaner. Petrol must not be used on any of the Bostik compounds, as it will cause them to peel off. When 80 octane spirit is used for cleaning, the vehicle must stand in the open, and afterwards be thoroughly ventilated.

Bostik cleaner for finally cleaning surfaces before applying a sealing compound, and for cleaning joints already sealed, when a repair is necessary. Apply sparingly.

Do not use Bostik cleaner as a thinner for any of the sealing materials.

USE WATER first then PETROL, and BOSTIK CLEANER to finish off cleaning

YOU MUST clean before you seal
otherwise the stuff will peel.

B. SEALING MATERIALS—

Bostik C.

Is an adhesive used to attach fabric to metal. It is painted on both surfaces to be stuck together and must be allowed to get nearly dry before making the joint. It must be kept workable by stirring, and warming if necessary, and the lid must be kept on the tin when possible.

Bostik A.A.

Is a sealing cement supplied in tins, which are distinguishable by a green band painted round the top. It is used mostly to seal around rivets and bolts and along seams. Though it is usually painted on (see Fig. 2), in corners particularly, it must be smoothed over, using a finger or putty knife.

To make Bostik A.A. workable, it must be stirred well, and in cold weather the tin must be heated by standing it in hot water. *Always keep the lid on the tin when not in use.*

Bostik 692

Is a sealing cement supplied in tubes, with detachable nozzles, and which are operated by winding a key at the bottom of the tube. Apply 692 by holding the nozzle to a seam and turning the key. When used for filling open seams or large cracks, first apply Bostik C as a primer. In cold weather, warm the tube slightly to give an easy flow of compound; if the cement is too stiff, the tube will burst. *Replace the cap on tube after use, and always keep the detachable nozzle clean.* Wash it out with Bostik cleaner before putting it away at night. (See Fig. 5).

Boscoprene 551

Is a sealing cement used only where there is likely to be oil, because it is oil resistant and will set without coming into contact with the air. It is supplied in two parts; Part A in a tin, and Part B in a bottle. *To use:* shake the bottle well, add the whole quantity to the Boscoprene Part A, and mix well by stirring. *Then use at once.* Putting the lid on the tin will not stop the Boscoprene setting hard.

Asbestos Compound

Is used for sealing cracks, and the seams of such parts as hatches. It is tenacious but easily worked. It must be applied liberally, but not too thickly, with all edges "feathered" off and with the top smoothed over to present an unbroken surface. (See Fig. 3).

W.D. Pressure Plastic

Is a red waterproof putty-like substance with which quite large holes can be filled. Where a large plug of plastic is required, it should be built up by putting on the plastic in layers, and worked out to a "feather" edge. Pressure Plastic is difficult to work, and must be made pliable by kneading. If this does not make it workable enough, it must be heated. The easiest way to do this is to cut up the plastic into workable sized lumps. Place one or two lumps in a tin, and put the tin into a bucket of hot water. **DO NOT WET THE PLASTIC.**

Jointing Strips

Are rubber covered felt strips used to make a joint between the detachable and fixed "hardware" fittings. These strips are stuck to the metal with Bostik C.

Fabric (See Fig. 6)

Must be handled with care and kept clean. It is used for sealing ventilators, gun apertures, etc. It is supplied in shaped pieces ready for fitting. If one side is shiny, this side must face outwards.

The fabric pieces will be stencilled on the inside to give the position in which they are to be fixed. Before fitting, they must be examined for any holes or thin places. Repair by means of a fabric patch attached with Bostik C.

Fabric covers are attached to metal by means of Bostik C which is applied to contacting surfaces, and must be allowed to become nearly dry before making the joint.

C. GREASE

Lanolin

Is a yellow coloured grease used for sealing a few special parts, such as periscopes.

D. PAINT

Anti-corrosive Paint : a blue paint used to protect certain parts from the corrosive effects of water. Apply with a brush, and see that the film of paint is unbroken. Water in the paint will cause bubbles.

BRUSHES

1" and 2" brushes are supplied with the kits of sealing materials. Before use, all brushes must first be soaked, so as to stop the bristles falling out, then check that the 1" brush has bristles 1" long (*i.e.*, the diameter of a halfpenny), and the 2" brush 1½" long (*i.e.*, the diameter of a penny). If the bristles are longer cut them off to this length. Cut bristles square.

Allocate the brushes as follows :

Use—1" brush for Bostik A.A. and Boscoprene.

1" brush for anti-corrosive paint.

the 2" brush for dusting, and then for applying Bostik C.

Keep brushes soaked in Bostik cleaner.

CORDTEX AND FITTINGS

Cordtex

Is an explosive in the form of a flexible cord that is used for blowing off fabric covers. Bostik compound will damage Cordtex so that it will not explode when required. *Do not allow Bostik to touch the Cordtex.*

Detonator

No. 33 Electric : is an electric type detonator used for firing Cordtex. Bind the detonator to the Cordtex with insulating tape with the leads towards the shortest end of the Cordtex. Attach the detonator leads to the wiring harness, and cover the joint with insulating tape.

Wiring Harness

Consists of one or more lengths of flex attached to a suitable adapter, ready for coupling the detonators to the vehicle electrical circuit.

SUPERVISION OF SEALING

Experience has shown that it is vital for sealing to be supervised by a responsible officer. He must undertake to plan the operation, and to inspect all work in detail and pass it as satisfactory, or delegate such inspection to another officer or N.C.O.

The sealing instructions in Chapter IV are grouped where possible under the material specified. So far as is practicable, seal in the sequence set out.

The officer supervising should inspect for—

CLEANING before putting on the sealing compounds.

WASTE of materials through painting Bostik alongside of, instead of in, the joints; leaving the lids off tins; failure to clean brushes.

EFFICIENCY of all sealing. Bostik must be applied in an unbroken film. Check that this is so in all awkward corners. Pressure Plastic and grease must be firmly pressed down at the edges. Fabric must be folded neatly, with no gaps in sticking down the edges.

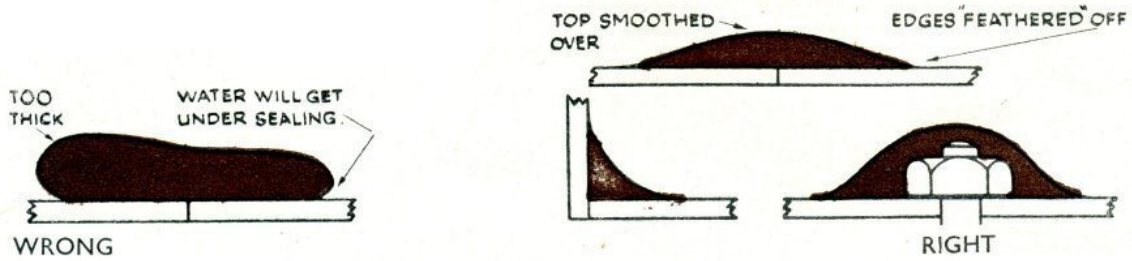


Fig. 3. Sealing with Asbestos Compound.

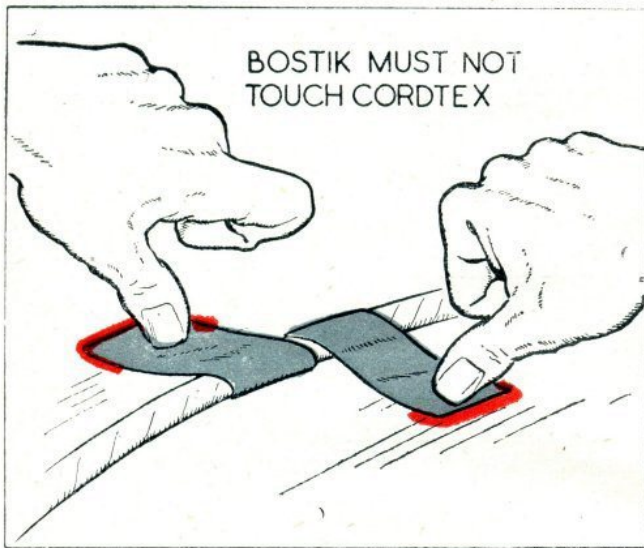


Fig. 4. Fixing Cordtex.

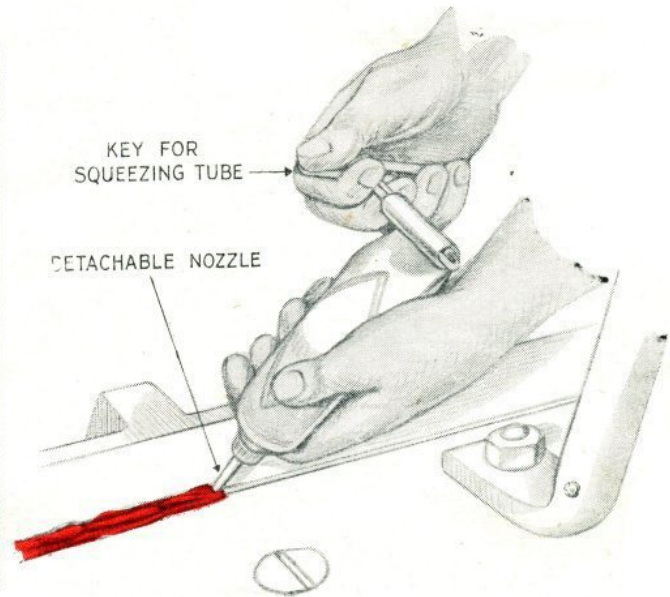
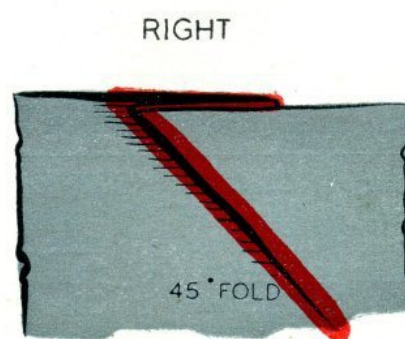
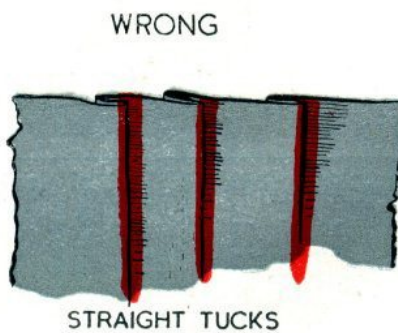


Fig. 5. Applying Bostik 692.



FABRIC TO BE FIXED IN POSITION WITH BOSTIK 'C' APPLIED TO ONE SIDE, & TO CONTACTING SURFACE. WHEN BOSTIK 'C' IS DRY, EDGES ARE TO BE PAINTED OVER WITH BOSTIK 'AA'

Fig. 6. Taking up slack in waterproof fabric.

 Bostik
(see Text)

 Asbestos Compound

Fabric 

CHAPTER II

STORES REQUIRED FOR SEALING

Index to Special Kits

<i>Kit</i>	<i>Description</i>	<i>Issue basis</i>
Sherman III (6-ft.) A ..	"Hardware" which crews will need during Stages 1 and 2 of the Sealing Instructions.	1 per vehicle 2 per squadron as spares.
(6-ft.) C ..	Software stores which crews will need during Stage 1 of the Sealing Instructions.	1 per vehicle 2 per squadron as spares.
(6-ft.) D ..	Software stores which crews will need during Stages 2 and 3 of the Sealing Instructions.	1 per vehicle 2 per squadron as spares.
(6-ft.) E ..	Explosive stores which crews will need during Stages 1 and 2 of the Sealing Instructions.	1 per vehicle 2 per squadron as spares.
(6-ft.) F ..	Software stores which crews will need in Stage 1.	1 per vehicle 2 per squadron as spares.

Kit "D" will be supplied in a box marked "Not to be opened until just prior to embarkation," and this box will be included in Kit "C." It is imperative that this instruction be adhered to, otherwise units will find they are short of stores to carry out the work required in Stages 2 and 3 of the Sealing Instructions. If after completing the work required in Stage 1 of the Sealing Instructions, any of Kit "C" remains unused, this should be taken to the point of embarkation for use as spares.

On the following pages all items in the Kits are listed. This is done to enable the kits to be checked on receipt by units. In the event of a kit being found incomplete, the fact should be reported.

Further supplies of all materials listed in Kits C and D, can be obtained on application to the Commandant, Chilwell. Indents should be forwarded with a covering letter, marked for the attention of O. i/c P.2a (Wading).

WHEN ORDERING WADING KITS FOR THE SHERMAN, THE MARK OF VEHICLE MUST BE SPECIFIED.

THE KITS LISTED ARE SUITABLE FOR THE SHERMAN III (M4A2) ONLY.

Dwg. No.	Vocab. Section	Part No.	Designation	No. per Veh.	Remarks
TD.13673	LV1/USA	W.16001	KIT "A" SHERMAN III (M4A2) ..	1	6' Wading
TD.13648	LV1/USA	TD.13648	Chute, air exit	1	
TD.13645	LV1/USA	TD.13645	Base, inlet airduct	1	
TD.9937	VL1/USA	TD.9937	Plate, backnut	8	
TD.13659	LV1/USA	TD.13659	Tie-rod, side	2	
TD.13660	LV1/USA	TD.13660	Tie-rod, centre	1	
TD.9298	LV1/USA	TD.9298	Air duct, inlet	1	
TD.9294	LV1/USA	TD.9294	Air duct, exit	1	
TD.13646	LV1/USA	TD.13646	Strainer, inlet airduct	1	
TD.13647	LV1/USA	TD.13647	Strainer, exit airduct	1	
TD.9362	LV1/USA	TD.9362	Strainer, inlet and exit airduct ..	1	
TD.7020	LV1/USA	TP.18561	GEAR, RELEASE, AIRDUCT ..	1	
	LV1/USA	W.1931	Bolt, B.S.F., $\frac{1}{2}$ " x 1"	8	
	LV1/USA	V.9539	Nut, B.S.F., $\frac{1}{2}$ "	3	
	LV1/USA	W.10998	Washer, plain, $\frac{1}{2}$ "	3	
	LV1/USA	V.12411	Rope, hemp, 2", 16' long ..	1	
(Continued overleaf)					

Dwg. No.	Vocab. Section	Part No.	Designation	No. per Veh.	Remarks
TD.13674	LV6/MT15	NIV.556	KIT "C" SHERMAN III (M4A2) ..	1	6' Wading
TD.13668	LV6/MT15	NIV.503	KIT, WATERPROOF FABRIC ..	1	Package
TD.13643		NIV.549	Bag, 75 mm. gun ..	1	
TD.9940		NIV.411	Bag, co-driver, M.G. ..	1	
TD.11445		NIV.413	Cap, 75 mm. gun ..	1	12" dia.
TD.11451		NIV.419	Binding, 75 mm. gun ..	2	48" x 3"
TD.11446		NIV.414	Cover, ventilating cowl, hull, front ..	2	16" dia.
TD.11447		NIV.415	Cover, ventilating cowl, hull, rear ..	1	21" dia.
TD.11450		NIV.418	Cover, sponson drain holes ..	2	5" x 5"
TD.13669		NIV.554	Cover, air intake seating ..	1	24" x 38"
TD.11455		NIV.423	Strip, tab ..	1	48" x 3"
TD.13671		NIV.550	Patch, spare ..	1	
TD.13658	LV6/MT15	NIV.490	KIT, JOINTING STRIPS ..	1	Package
TD.11032		NIV.349	Strip, 35" x 1 1/4" x 1/2" ..	4	
TD.11036		NIV.353	Strip, 14 1/8" x 1 1/4" x 1/2" ..	2	
TD.11037		NIV.354	Strip, 7 5/8" x 1 1/4" x 1/2" ..	2	
TD.13670		NIV.506	Strip, 56" x 1 1/2" x 3/8" ..	1	For chute
TD.14517	LV6/MT15	NIV.555	Wiring harness ; with plug ..	1	
	LV6/MT15	NIV.431	Wire, iron, soft, 20 S.W.G., 48" long ..	1	
	LV6/MT15	NIV.205	Tape, insulating, 1/2", 2-oz. roll ..	1	
	LV6/MT15	NIV.206	Brush, paint, 2" ..	1	
	LV6/MT15	NIV.207	Brush, paint, 1" ..	2	
	LV6/MT15	NIV.208	Brush, wire, scaling ..	1	
	LV6/MT15	NIV.210	Knife, putty ..	1	
	LV6/MT15	NIV.211	Scraper ..	1	
	LV6/MT15	NIV.209	Scissors ..	1	
	LV6/MT15	NIV.215	Chalk ..	2	Sticks
	LV6/MT15	NIV.193	Bostik Cleaner ..	2	1-qt. tin
	LV6/MT15	NIV.192	Bostik C ..	3	1-qt. tin
	LV6/MT15	NIV.191	*Bostik A.A. ..	7	1-qt. tin
	LV6/MT15	NIV.194	*Bostik 692 ..	11	Tube
	LV6/MT15	NIV.195	Boscoprene A ..	2	1/2-pint tin
	LV6/MT15	NIV.196	Boscoprene B ..	2	Bottle
	LV6/MT15	NIV.200	*W.D. Pressure Plastic ..	4	8-lb. carton
	LV6/MT15	NIV.438	*Asbestos Compound ..	8	7-lb. tin
	LV6/MT15	NIV.203	Lanolin ..	1	1-lb. tin
	LV6/MT15	NIV.201	*Grease, G.S. ..	2	7-lb. tin
	LV6/MT15	NIV.364	*Pullthrough, single, Mk. IV.B ..	2	
FB.106/10			*Bolt, B.S.F., 3/8" x 1 1/4" with nut and lock nut ..	6	
			*Penny type washers, inside dia. 3/4", min. outside dia. 1" ..	6	
TD.13675	LV6/MT15	NIV.557	KIT "D" SHERMAN III (M4A2) ..	1	6' Wading
	LV6/MT15	NIV.191	Bostik A.A. ..	1	1-qt. tin
	LV6/MT15	NIV.200	W.D. Pressure Plastic ..	2	2-lb. carton
	LV6/MT1	NIV.438	Asbestos Compound ..	1	7-lb. tin
	LV6/MT15	NIV.207	Brush, paint, 1" ..	1	
TD.13671		NIV.550	Waterproof fabric, spare ..	1	

(Continued overleaf)

NOTE.—Part of items marked thus * may be supplied separately in Kit "F"

Dwg. No.	Vocab. Section	Part No.	Designation	No. per Veh.	Remarks
TD.13676			KIT " E " SHERMAN III (M4A2) ..	1	6' Wading
			Cordtex, 15' long ; with end caps ..	1	75 mm. gun
			Cordtex 24" long ; with end caps ..	1	Co-driver's M.G.
			Cordtex, 60" long ; with end caps ..	1	Inlet airduct base
			Cordtex, 12" long ; with end caps ..	3	Hull ventilating cowls
			Detonator, electric, No. 33 ..	6	

CHAPTER III

MAINTENANCE BEFORE SEALING

Carry out all necessary Maintenance Operations and Lubrication drill. *All hull cover plates removed must be left off until instructed to replace under Sealing Instructions.*

It will be necessary to remove the main engine access plates, escape hatch, and sand shields. Also the dust deflector at the rear of the vehicle if one is fitted.

Remove the rear towing shackles from the towing eyes and refit them, one in each of the lashing eye plates which are located on each rear lower corner of the hull.

If external stowage bins are fitted, these must be removed and handed to Unit Transport. Stow their contents as convenient within the vehicle, or also hand to Unit Transport.

A general check up must be made to ensure that the vehicle is in first class condition, and particular attention must be given to the following items.

The Engine

(a) Check starting. Wading requires instantaneous starting, both hot and cold.

(b) Check the cooling system. Wading will tax it severely. See that all hose connections and joints are sound. Check that the radiator is not overfilled, as any overflow may adversely affect sealing.

Lubrication

In carrying out Lubrication drill, give particular attention to the following points :—

(a) Exposed working parts to be smeared with Grease G.S.

(b) Lubricate the two steering control levers and linkage. Pay special attention to the right hand steering control cross shaft bearing. *No lubricator is provided ; an oil can must be used.*

(c) Lubricate clutch pedal shaft, and also make sure that the clutch thrust race is lubricated.

There are three lubrication holes on the race carrier in addition to the two greasers. Lightly smear grease G.S. over the clutch withdrawal mechanisms as a protection against corrosion.

(d) Lubricate accelerator pedal, rods and linkage. **NO MOVING PART OF LINKAGE MUST REMAIN WITHOUT LUBRICANT.**

(e) Check relief valves on bogie wheels.

(f) Lubricate the hinges on the Commander's, Driver's and Co-Driver's hatches, and ensure that they open and shut freely.

Transmission Casing

Check all casing bolts and also bolts securing the casing to the hull. *These must be tight.*

CHAPTER IV

SEALING INSTRUCTIONS FOR SHERMAN III.

Operations are grouped where possible under the material used.

It is desirable that work should proceed as set out in this book, but in adverse conditions this may not be possible. If it is absolutely necessary to depart from the sequence set out, this may be done by re-arranging the main operations. The individual items comprising these main operations must not be transposed.

STAGE**I****WORK TO BE CARRIED OUT IN THE FIELD OR IN CONCENTRATION AREA**

After completion of Stage 1, the vehicle must not be driven more than 100 miles.

INITIAL PREPARATION**1. Check Kits**

Check the contents of Kits, A, C and E to the Parts List. For identification of the main items of "hardware" see Figs. 1 and 18.

After checking the kits, paint the vehicle Number on the following items:—

Air inlet and exit ducts.

Air exit chute.

Turret bin and dust deflector, if fitted.

If "C" hooks on inlet and outlet ducts are broken, drill $\frac{3}{16}$ " dia. hole 2" from corner of duct and $\frac{1}{2}$ " from outside edge of angle (Fig. 7). Push bolt in from underneath, place strainer or link rod over bolt. Place washer on top of strainer or link rod, fit nut and lock nut.

Fully restow the vehicle internally.

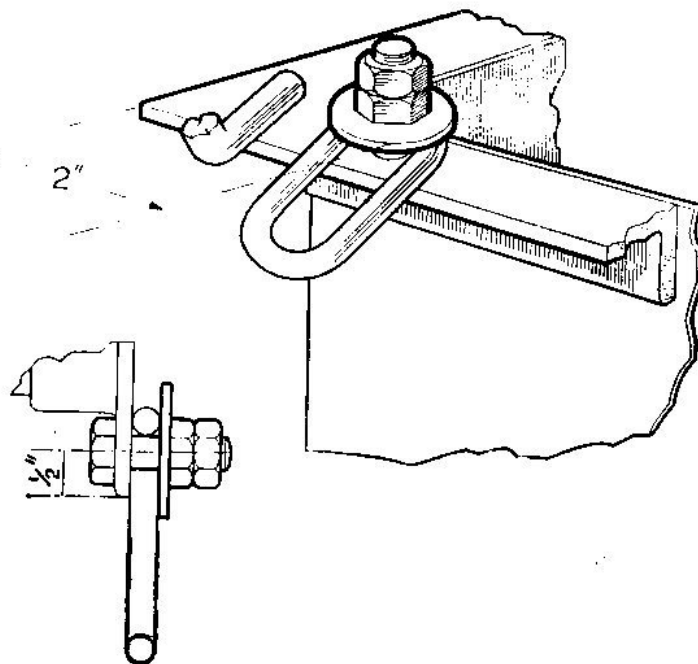


Fig. 7. Modification to air ducts

2. Clean the Vehicle

- (a) Remove the worst of any mud and dirt by use of the scraper and wire brush.

IMPORTANT.—For protection during sea transit, a putty-like compound or a black tape was put over many parts of the Sherman III by the manufacturers.

Every trace of both must be removed.

- (b) Wash down with water, using a stirrup pump, which should be available on loan from unit equipment. The jet will clean out awkward corners.
- (c) Remove any dirt remaining with the scraper or wire brush, and then let the vehicle dry.
- (d) Wash down the "hardware."
- (e) Thoroughly clean out the engine compartment and around the transmission case, using petrol to remove all trace of oil. If any oil is left, it will seep out and destroy the sealing.
- (f) Clean off with petrol any other oil or grease remaining on the vehicle.
- (g) Move the vehicle to a clean site. If possible, mount it on sleepers, or run it over a pit to facilitate access to the hull bottom plate.
- (h) Make sure that in the event of wet weather cover can be erected without moving the vehicle.
- (i) Break the tracks. Remove sprockets and front mudshields.

SEALING LOWER HULL

Use a rag or piece of cotton waste soaked in Bostik Cleaner to clean each joint immediately before applying the sealing compounds.

1. W.D. Pressure Plastic

Examine the hull bottom and side plates and sponson floors, for any unfilled bolt or rivet hole. Be sure that no such hole is obscured by dirt and is overlooked. Any hole found must be securely plugged with Pressure Plastic, or a bolt inserted and then sealed with Bostik A.A.

- (a) Using Pressure Plastic seal each end of the transverse channels marked B in Fig. 12 by plugging with plastic. Fig. 8.

Seal the gaps between the welding along the edges of these channels, wherever the seam exceeds $\frac{1}{8}$ " in width.

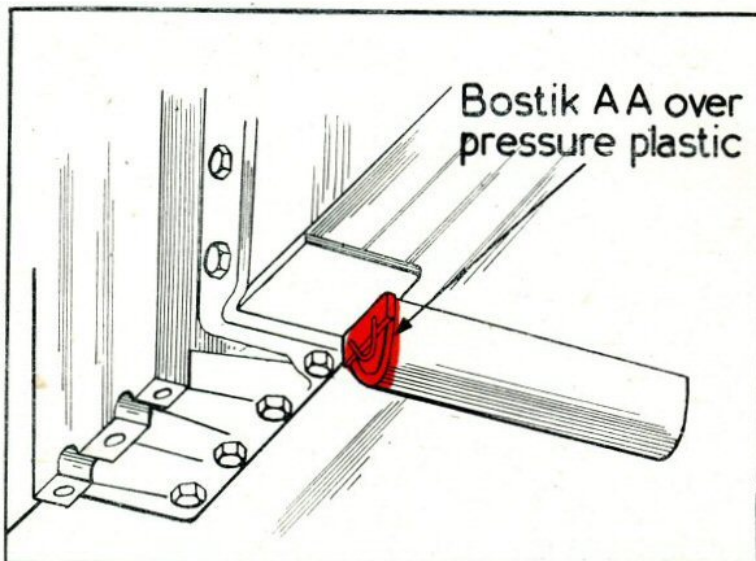


Fig. 8. Sealing transverse channel.

Bostik
(see Text)

Fig. 9. Idler bracket.

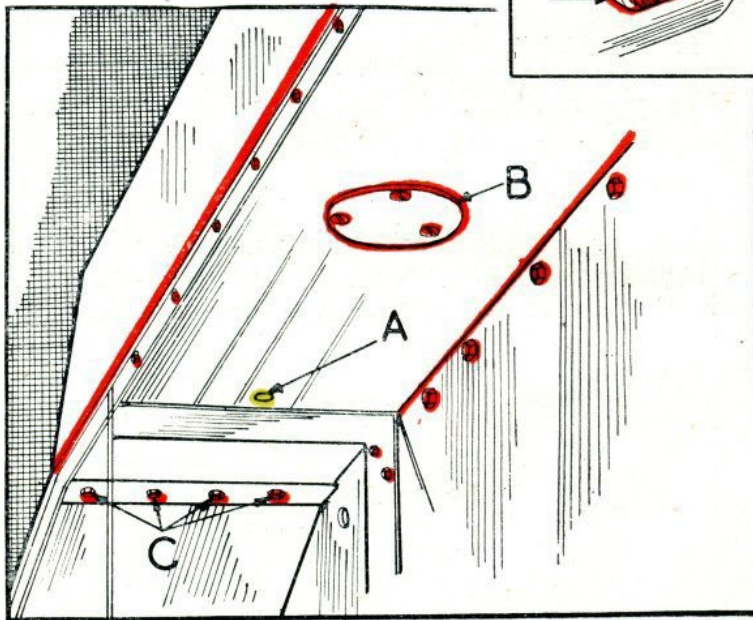
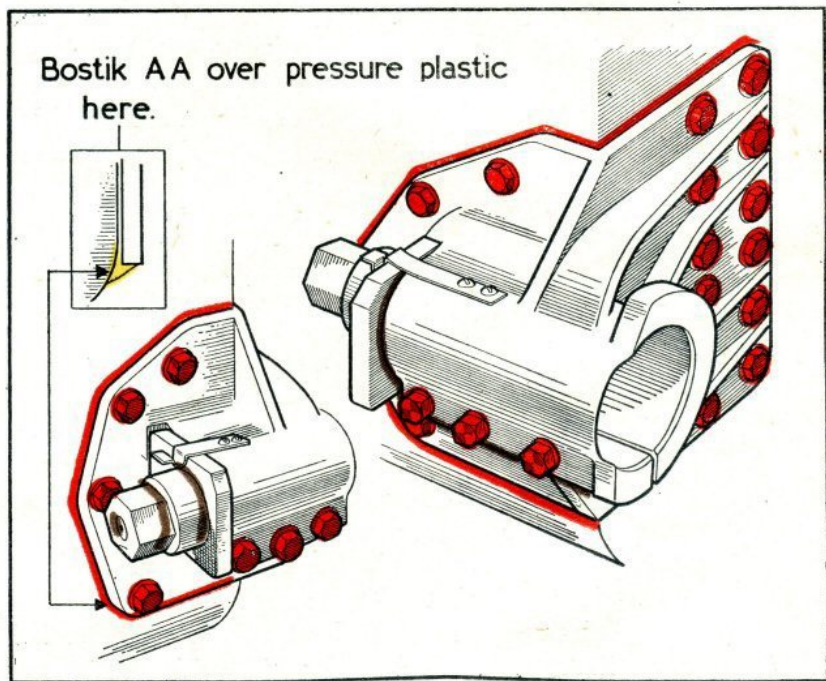


Fig. 10. Sponson floor.

Bostik (see Text)

W.D. Pressure Plastic

Asbestos Compound



(b) Seal the bottom edge of each idler bracket with Plastic (Fig. 9), after making certain that all grease has been cleaned away.

(c) Plug the drain holes in the sponson floor, marked "A" in Fig. 10.

Use a plug of plastic large enough to extend half an inch around the edge of each hole, and press it finally into the aperture.

(d) Seal the joint of the transmission casing to the hull. Scrape out all along the joints, thoroughly clean away any trace of oil. Then roll plastic into long thin rolls and press these into the joint, building the sealing up to ensure that there are no gaps in the plastic.

Wherever the joint between the transmission casing and hull, whether along the top, bottom, or sides, shows a gap exceeding $\frac{1}{8}$ " plastic must be used.

(e) The space between the bogie brackets and the hull is already filled with petroleum jelly by the manufacturer. As this will destroy W.D.P.P. at join, remove the jelly to a depth of $1\frac{1}{2}$ " from each corner between bracket and hull, clean thoroughly, and fill with W.D.P.P.

2. Bostik 692

(a) Seal along each joint of the transmission casing to the hull where not already plugged with plastic.

(b) Seal each vertical joint in the transmission casing with a bead of 692.

3. Bostik A.A.

Paint Bostik A.A. over the following items :—

(a) *Bottom Plate*—

All bolts and screw heads.

All welded seams.

All Pressure Plastic sealing.

(b) *Bogie and Idler Brackets*—See Figs. 9 and 13.

Round edges and over attachment bolts, including over Pressure Plastic sealing of Idler brackets.

(c) *Transmission Casing*. See Fig. 11.

Over joints of final drive covers to casing.

Over Pressure Plastic at joints of casing to hull.

Over Bostik 692 sealing.

Over all bolts on the casing, and attaching casing to hull.

(d) Seal outside flange of final drive casing with Bostik A.A. on joint gasket and boltheads.

Where the transmission case is of the split type, seal over joint between sections of the case. Replace front mudshield, painting each bolt head with Bostik A.A.

(e) *Sponson Floors*.

Over all bolts and screw heads.

Over all welded seams, *i.e.*, seams of sponson floor to lower hull side plates, and of sponson floor to upper hull side plates, including both edges of the angles which support the sandshields.

Around access plates marked " B " in Fig. 10 and over attachment screws of these plates.

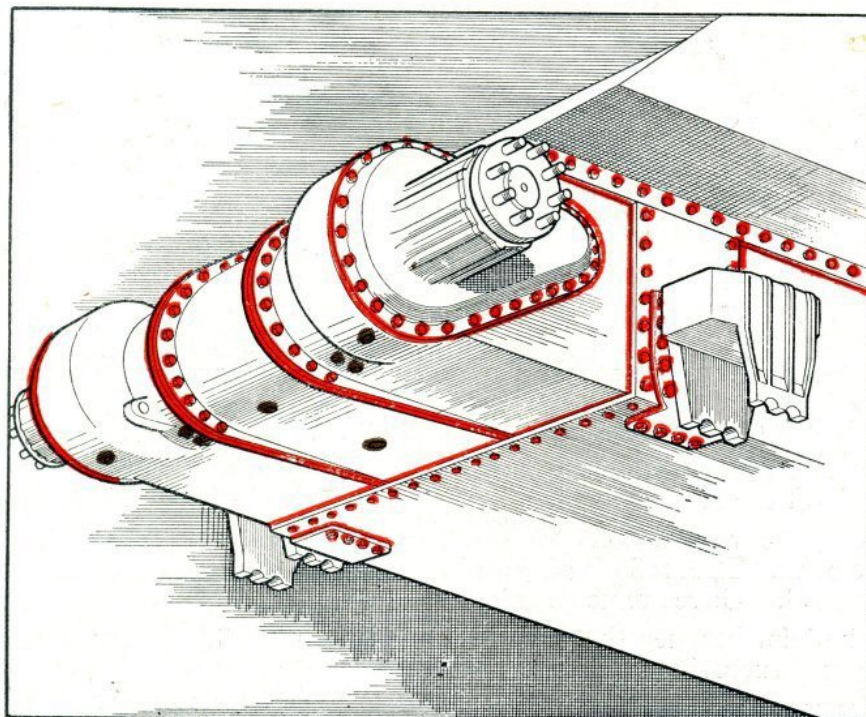


Fig. 11.
Transmission
casing.

Bostik
(see Text)

Asbestos Compound

4. Asbestos Compound

Using A.C. seal :—

(a) *Bottom Plate.*

All plugs and plates marked "X" in Fig. 12 by covering completely.

Seal six dump valves, marked "Y" in Fig. 12 as follows :—

- (i) Open valve, clean seating, and smear A.C. on seating.
- (ii) Close valve and cover completely with A.C.

Seal Escape Hatch as follows :—

- (i) Remove hatch, and remove gasket from hatch. See Fig. 14.
- (ii) Smear A.C. on seating for gasket, and replace gasket.

If gasket is a poor fit, stick it to the hatch with Bostik A.A. If the gasket has stretched it will be necessary to cut it to fit. Be sure it is rejoined without a gap.

- (iii) Fill groove in gasket with A.C.
- (iv) Replace hatch and lock in position.
- (v) Make fillet of A.C. all round edge of hatch.

(b) *Transmission Casing.*

Seal all plugs and exposed shaft ends. See Fig. 11.

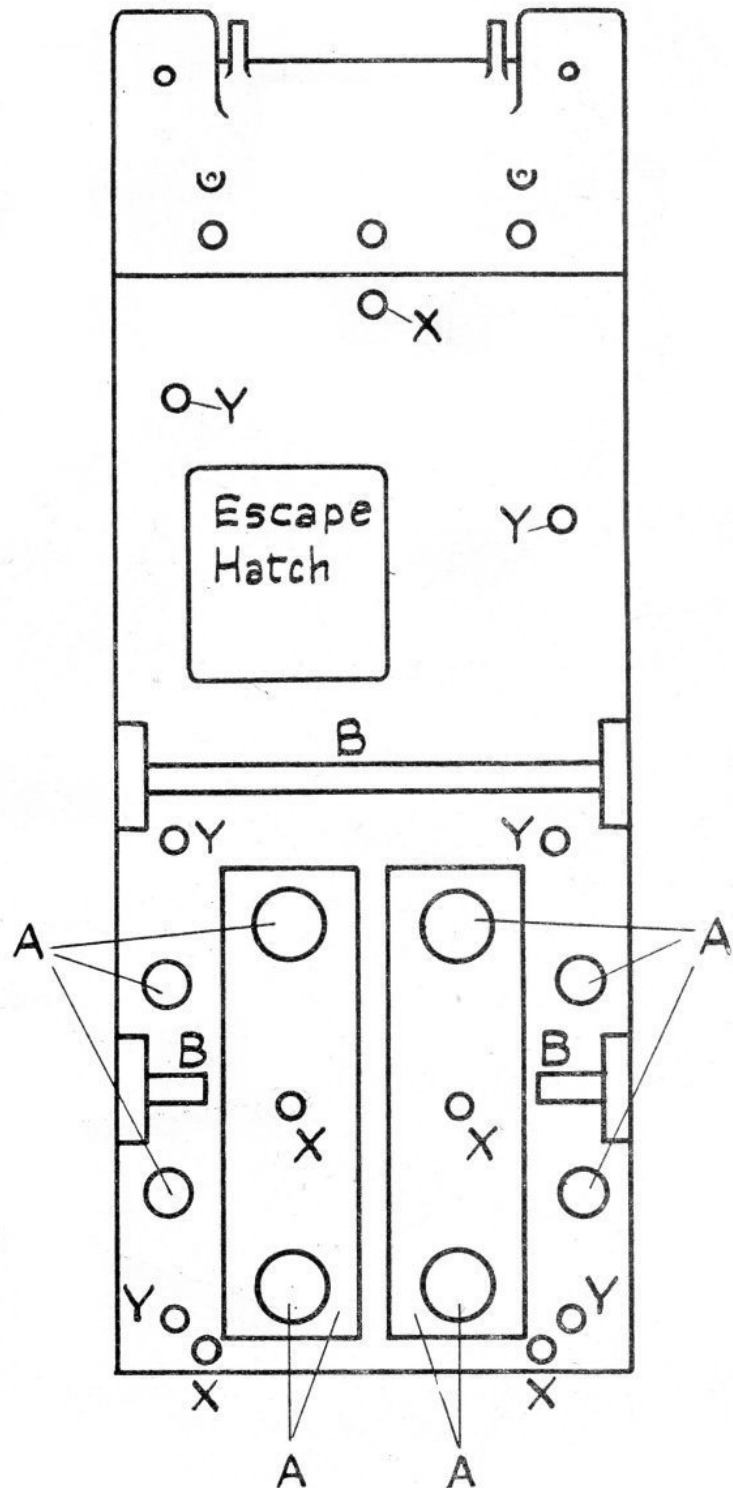


Fig. 12. Diagram of hull bottom.

**PAINT BOSTIK A.A.
OVER ASBESTOS COMPOUND**

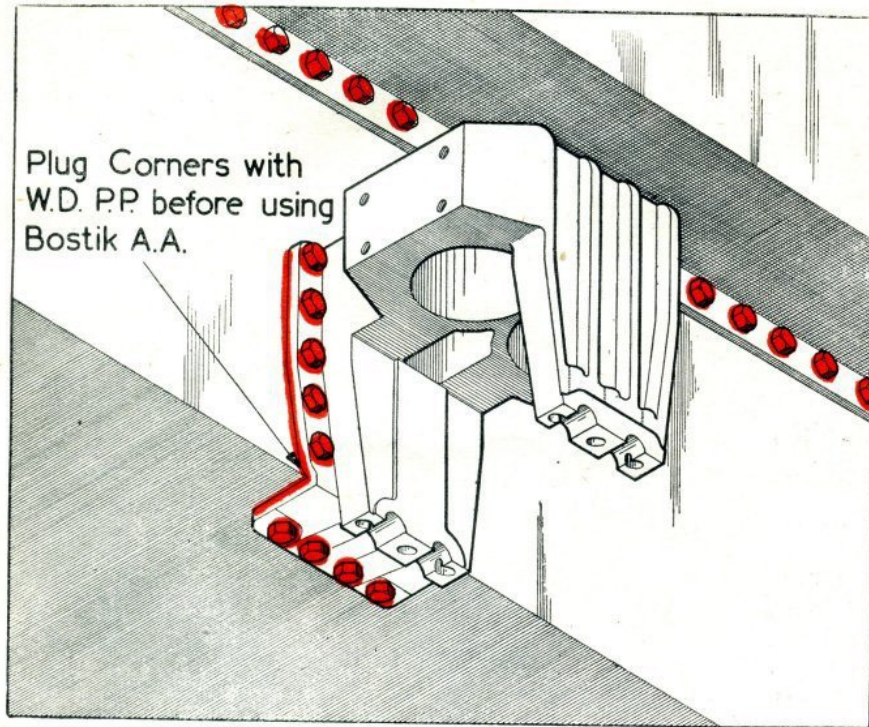


Fig. 13. Bogie bracket.

**YOU
MUST
CLEAN
BEFORE
YOU SEAL**

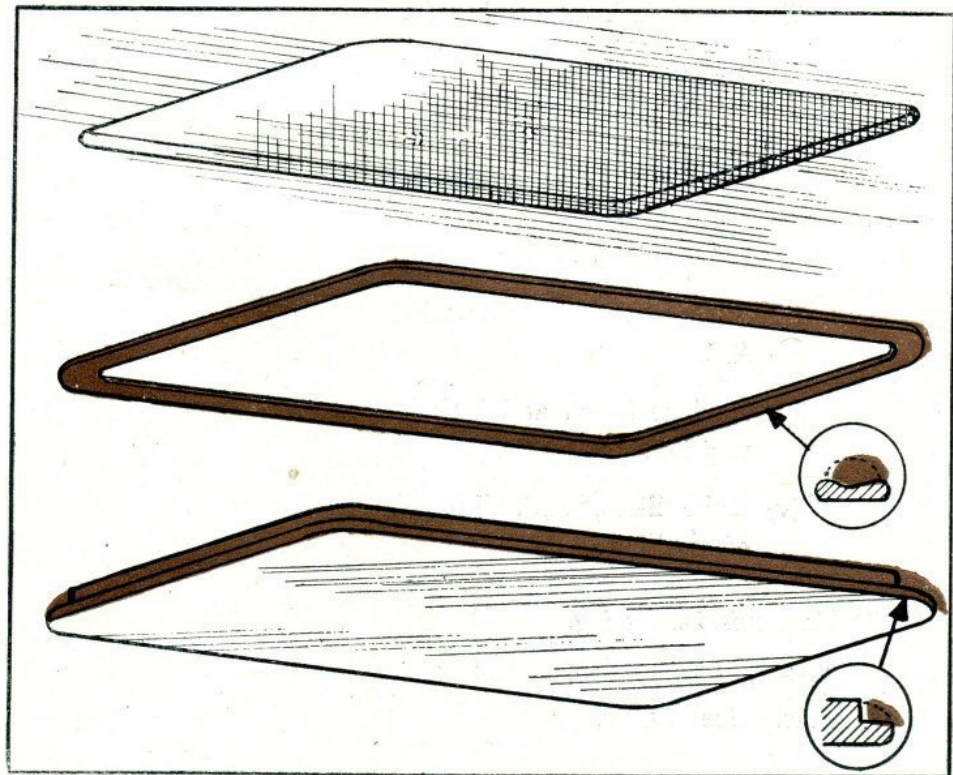


Fig. 14. Escape hatch.

Bostik (see Text)

Asbestos compound

5. Boscoprene

Seal the access plates on the bottom plate, marked "A" in Fig. 12.

NOTE.—*This must not be done until the engine compartment has been thoroughly cleaned out.*

(a) Discard cork gaskets.

(b) Clean seatings on hull bottom plate and access plates with Bostik Cleaner.

(c) Mix Boscoprene by pouring the contents of the bottle into the tin, and stirring well. Then paint with Boscoprene the seating on access plate and on hull bottom plate. See Fig. 15.

IMPORTANT.—*Item (c) must be done by three men, so that both access plate and the hull bottom plate are painted at the same time. The Boscoprene will begin to dry off within a couple of minutes, and the plate should be put in position and attached by inserting the centre bolt each side and tightening it up.*

(d) Insert the remaining bolts, first smearing the underside of each bolt head in Boscoprene. Tighten these bolts.

Be careful not to get Boscoprene on the threaded portion of the bolt.

(e) Remove the first four bolts to be inserted, again smear Boscoprene on the underside of the bolt head and replace and tighten.

(f) Inspect for missing bolts and replace as necessary, and seal with Bostik A.A.

(g) When each plate is securely fastened, smooth off any Boscoprene exuding round the edge.

(h) Finally paint an adequate fillet of Bostik A.A. round the edge of each plate and over the attachment bolts.

COMPLETION OF LOWER HULL SEALING

Material required :

Two fabric patches 5" × 5".

Asbestos Compound.

Bostik A.A. and C.

Bostik Cleaner.

(a) Electric Horn

Seal the horn with Asbestos Compound. See Fig. 16.

(i) Remove the front and rear covers, and remove the rotor by taking out the screws fitted round the boss. Seal shaft with grease behind the rotor.

(ii) Place a bead of A.C. on the face of the body, behind the rotor. Replace the rotor.

(iii) Seal with A.C. the entry of the cable into the rotor casing, and all joints and studs on the rotor casing.

(iv) Replace front and rear covers, and seal the joint of the rear cover to the body, using A.C.

(v) Smear A.C. all over the cable sheathing and joints.

(b) Sandshields

First cover with a 5" × 5" fabric patch the Pressure Plastic sealing of drain holes marked "A" in Fig. 10. Clean around each hole with Bostik Cleaner and paint with Bostik C; also paint dull side of fabric with Bostik C. When Bostik C is nearly dry, press fabric in place. Now replace all sandshields. When inserting bolts, marked "C" in Fig. 10 paint around each bolt hole with Bostik A.A. After tightening each bolt, paint around head with Bostik A.A.

(c) Replace Sprockets and REMAKE BOTH TRACKS. If more convenient, this may be done before the completion of item (b). NOTE: Tracks cannot be adjusted after fitting the air exit chute.

Paint over all A.C. sealing with
Bostik A.A.

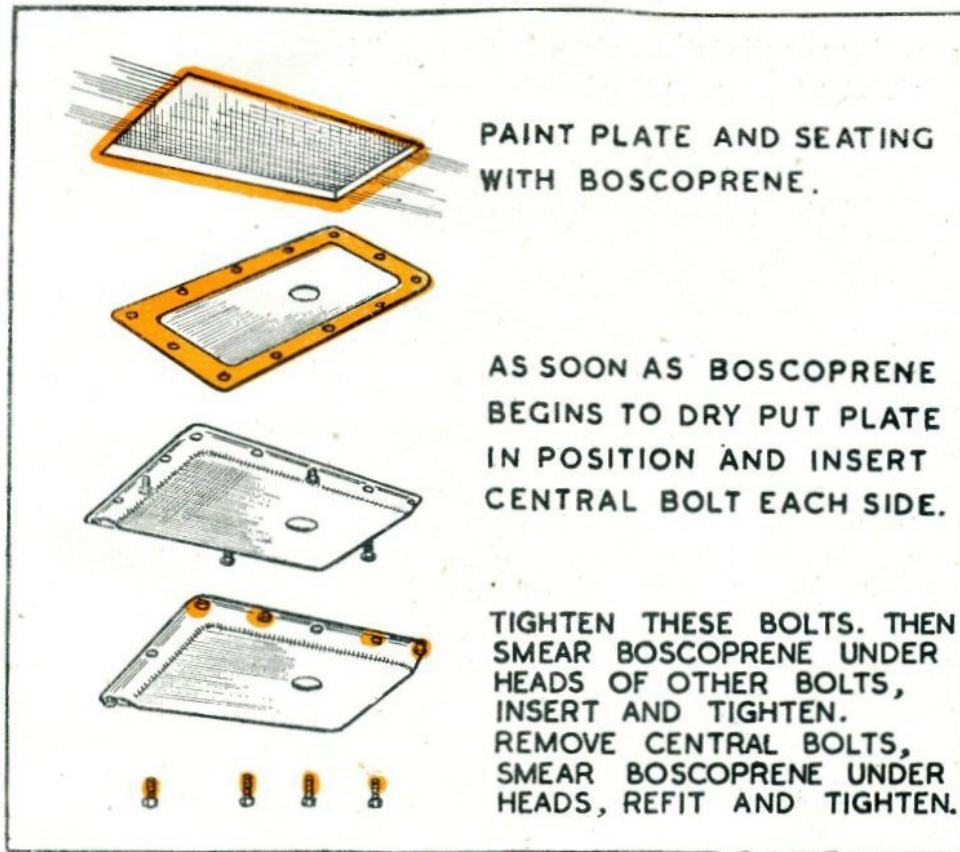


Fig. 15. Sealing access plate.

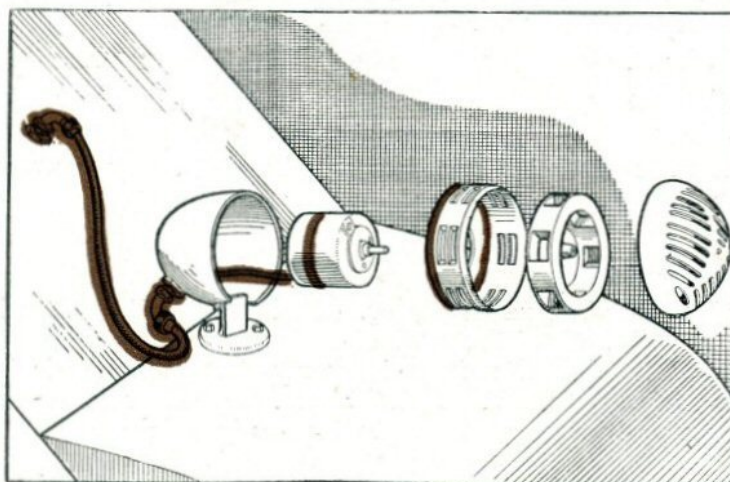


Fig. 16. Sealing horn.

Asbestos Compound

Boscoprene

FITTING AIR EXIT CHUTE

Material required :

Air exit chute.
Jointing strip.
Eight setbolts and " plate " washers.
Three hook bolts.
Three tie rods.

Bostik C.
Bostik 692.
Bostik A.A.
W.D. Pressure Plastic.
Bostik Cleaner.

Before placing the chute in position (Figs. 1, 17 and 18) attach the long jointing strip from Kit C to the bottom edge of the upper rear hull plate. Paint the plate and one side of the strip with Bostik C, and when the Bostik is nearly dry press the strip into place. Paint over the jointing strip with Bostik C and also paint with Bostik C the top face of the chute where the strip will seat. Allow to dry thoroughly before fitting chute.

Fit the tie rods into the holes in the top face of the chute (the long rod goes in the centre) and lift the chute into place at the same time inserting the tie rods into the brackets.

Fix the side flanges of the chute to the side support plates, using four $\frac{3}{4}$ " B.S.F. set bolts each side and assembling a " plate " type washer on each bolt. Do not fully tighten these bolts.

Using three hook bolts, attach the bottom of the chute to the staples welded to the lower rear hull plate.

Note. If the gap between the chute and the rear hull sloping plate exceeds $\frac{1}{2}$ inch it will be necessary to fit two thicknesses of reit instead of one.

The additional reit can be obtained from the spare kits carried by squadrons.

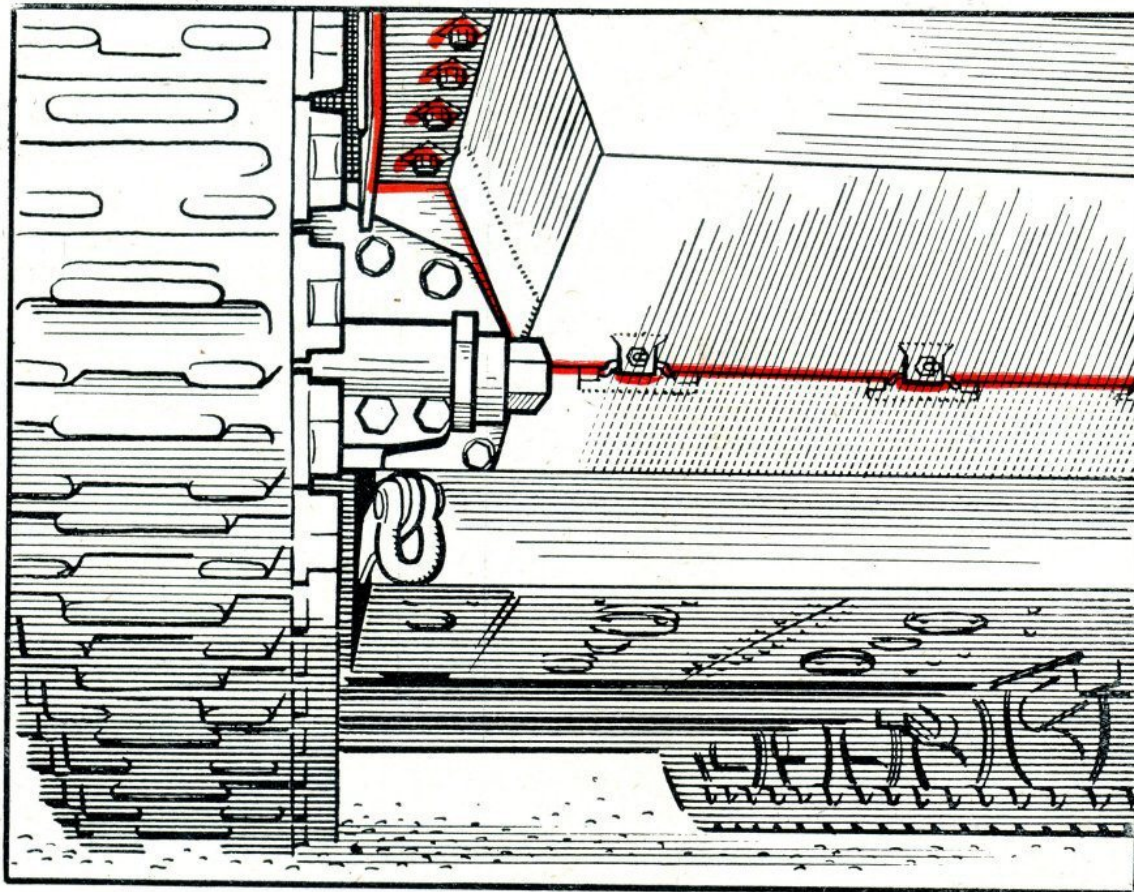


Fig. 17. Air exit chute fastening.

Bostik
(see Text)

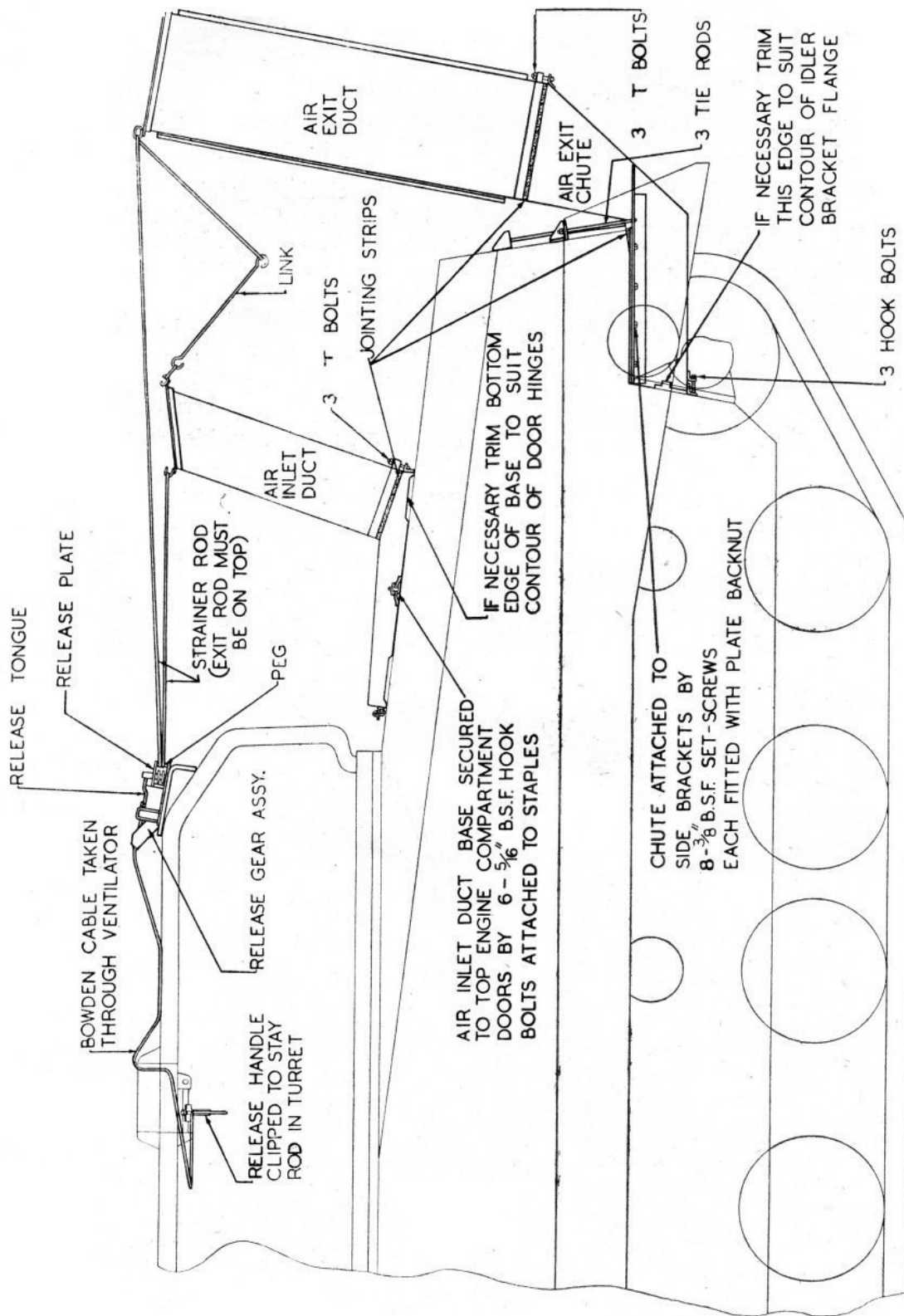


Fig. 18. Diagram of hardware.

Now tighten the hook bolts and tie rods, then side bolts, until the chute is firmly positioned and cover with A.C. the heads of these bolts. The gap between the top face of the chute and the hull should be closed by the jointing strip, but the openings at the end of this strip, and all other joints between the hull and chute must be plugged with W.D. Pressure Plastic wherever possible (*i.e.*, where the gap exceeds $\frac{1}{8}$ in.).

Take special care where the chute crosses the idler brackets, and in sealing the joints of the side supporting plates to the hull. Wherever it is impracticable to plug the seam with W.D. Pressure Plastic seal it with Bostik 692. Finally paint Bostik A.A. over all joints, covering previous sealing, including the jointing strip, and the welded seams of the chute itself.

FITTING JOINTING STRIPS

Fit jointing strips to the air inlet duct base and the air exit chute, on seatings for the ducts.

- (i) Sort out strips to fit seatings (*i.e.*, two long strips and two short strips for each seating).
- (ii) Clean the strips and the seatings.
- (iii) Paint one side and the ends of each strip with Bostik C, also paint the seatings with Bostik C.
- (iv) When Bostik C is nearly dry, press jointing strips into place. Make sure there are no gaps where the strips butt. The strips must be given time to dry before filling the duct.

ARMAMENT MAINTENANCE

Carry out a thorough maintenance routine on all weapons ; then proceed as follows :—

Test and align gun sights.

Prepare the 75 mm.

- (i) Oil the bore and the chamber.
- (ii) Using the rope from Kit "A," make a lanyard with a running loop at one end.
- (iii) Feed this lanyard, plain end first, through the bore from the muzzle end, and pass into the loop a piece of clean dry rag, large enough to fit firmly in the gun muzzle.
- (iv) Pull on the lanyard until the rag has formed a good tight bung.
- (v) Check that the free end of the lanyard is clear of the breech, and close the chamber with a piece of oiled rag. Make sure this is securely packed into the chamber.

Prepare in the same way as the 75 mm., the co-axial and co-driver's machine guns, but use a standard pull-through instead of the lanyard and rag.

It is convenient to remove both machine guns to carry out maintenance.

Do not replace either gun until told to do so.

Two inch Bombthrower (if fitted).—Plug the turret aperture for the Bombthrower with cotton waste and seal over the outside with Asbestos Compound.

Four inch Smoke Generator Discharger (if fitted).—Fit the muzzle cover to the Discharger, seal around the cover with Asbestos Compound and thoroughly smear Grease G.S. over all working parts.

WIRING HARNESS

Material required :

- Wiring Harness.
- Fabric strip (for cutting " tabs ").
- Bostik C and Cleaner.
- 20 S.W.G. iron wire and insulating tape.
- Cotton waste.

The wiring harness (see Fig. 19) is installed, starting at the plug end, and is attached at approximately every foot, either by fixing to some convenient point with insulating tape or with fabric tabs. Each tab should be about 1 in. wide, looped around the wire, and with its ends stuck to the hull with Bostik C. See Fig. 4.

Leaving a loose end of cable long enough to insert in the dashboard socket, fix the harness to one

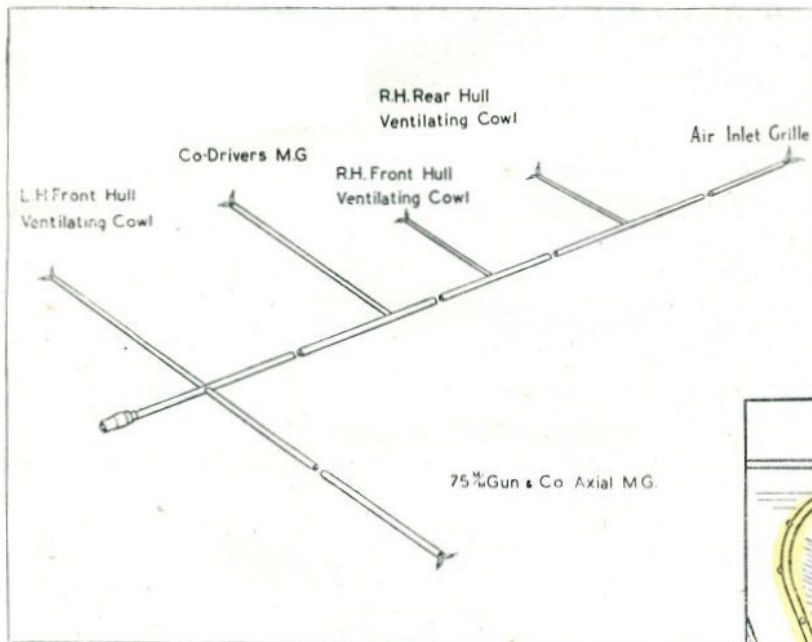


Fig. 19. Diagram of wiring harness.

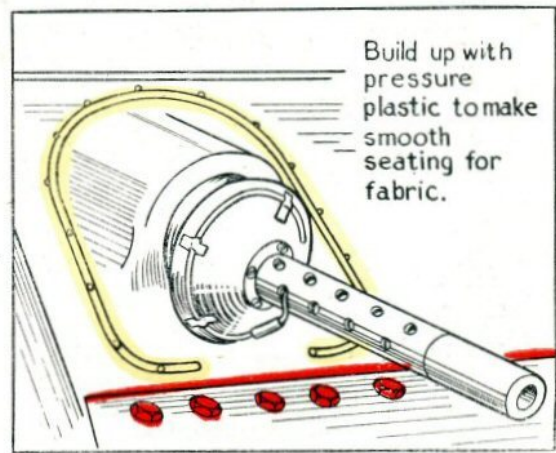


Fig. 20. Cordtex on co-driver's machine gun.

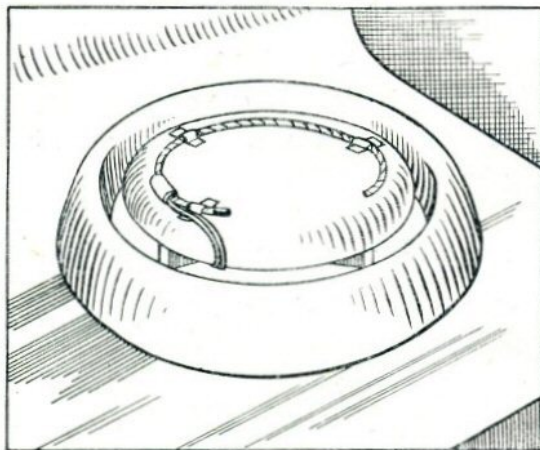


Fig. 21. Cordtex on hull ventilator.

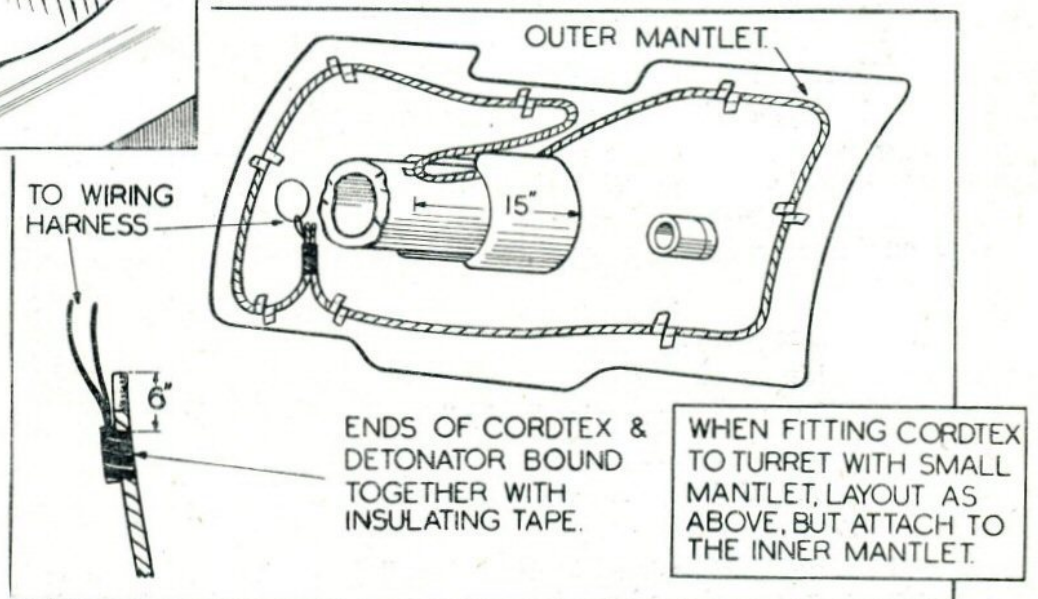


Fig. 22. Cordtex on turret mantlet.

of the screened cables leaving the junction box behind the instrument panel. Take the shortest branch up the sponson wall and across the roof, and thread through the L.H. forward ventilating cowl to the exterior.

The long single branch for the 75 mm. and co-axial machine gun must not be taken into the turret until instructed to do so, when sealing the turret.

The longest branch, which has four secondary branches, is fixed as follows:—From the junction box across the front of the vehicle; attach it to a screened cable.

Replace the co-driver's machine gun, then thread the first secondary branch through a hole in the barrel guard, which will be found exposed by an opening in the left hand side of the gun mounting. Work the flex along between the barrel guard and the barrel and bring it out through the first hole in the guard, to be exposed on the outside of the hull mounting.

Continue the main wire up the slope of the sponson roof. There is a short branch to be threaded through the R.H. forward ventilating cowl to the outside. Continue the main wire along the top of the sponson wall or on the sponson roof, to the rear R.H. corner of the fighting compartment, where there is a short branch to be threaded through the R.H. rear ventilating cowl to the outside. Bring the main wire down the rear wall of the fighting compartment, and take it into the engine compartment as follows:—

Remove a small sheet metal plate immediately below the fuel tank selector valve on the rear wall of the fighting compartment and thread the wire through the hole exposed OR—If the small plate is not fitted, and the edge of the larger plate in the same position cannot conveniently be loosened, thread the wire along beside a breeze conduit and through a hole about 6 ins. above the fuel tank selector valve.

See that no end of the harness is "shorted;" insert the plug into the dashboard socket, and, with a spare lamp bulb, test each run of the harness. After removing the plug, wrap it with insulating tape, to stop its accidental re-insertion in the socket. Cover the end of the air inlet branch of the harness with insulating tape.

Pack each hull ventilator with cotton waste, pushing it up from below. This must be done to minimise blast from the Cordtex which is used to blow fabric from over the ventilators.

FITTING CORDTEX

Material required :

- Cordtex.
- Detonators No. 33, electric.
- Fabric strip for "tabs."
- Bostik C.
- Bostik Cleaner.
- Insulating tape.

(a) Bind a detonator to each piece of Cordtex, with insulating tape, with the leads towards the shortest end of the Cordtex. On the three pieces of Cordtex 2 ft. and over in length, the detonator should be 6 in. from one end. On the shortest pieces of Cordtex, the detonator may be 3 in.-4 in. from one end. Arrange each detonator so that its leads run towards the nearest end of the Cordtex.

(b) Cut strips of fabric 1 in. wide, as for the wiring harness and use these to attach the Cordtex, as Fig. 4. *Be sure only the ends of each tab are stuck on with Bostik C and that the Bostik does not touch the Cordtex.*

(c) Attach Cordtex, by "tabbing" to:—

- (i) The turret as Fig. 22, depending on the type of mantlet.
- (ii) The co-driver's machine gun mounting as Fig. 20.
- (iii) Each hull ventilator as Fig. 21.

(d) Couple each detonator to the wiring harness *except the turret detonator*, and bind the joint with insulating tape.

REMEMBER.—To enable you to use your armament after landing, the Cordtex must detonate. This depends on the following :—

(1) Sound connections to the wiring harness of the detonator leads. Twist the wires securely together, and bind each connection individually with insulating tape, before binding the whole joint.

(2) No Bostik on Cordtex, as Bostik will cause it to deteriorate.

(3) Sufficient slack in Cordtex and wiring harness to allow for slight movement of guns or turret due to ineffective locking.

NOTE.—Do not fit Cordtex to inlet grille at this stage.

FITTING FABRIC (except to turret)

Material required :

Fabric covers.

Bostik C.

Bostik Cleaner.

W.D. Pressure Plastic.

Selecting the correct fabric cover, according to the markings, fit one over each hull ventilator. See Figs. 23 and 24.

Fabric must be attached by first offering it up and marking its outline. Clean with Bostik Cleaner where fabric is to be attached, then paint a band of Bostik C at least 2 in. wide within the outline of the fabric, and also around the edge of the fabric on the undoped side. When the Bostik C is nearly dry, press the fabric neatly in place. Any Bostik C exuding from the edge must be smoothed along the edge. Any damage must be repaired by means of a fabric patch attached by Bostik C.

Take up slack in the fabric by making a neat fold at 45 degrees to the edge of the fabric. Make sure that the ends of this fold are sealed. Before fitting fabric always inspect for pin holes by holding up to the light (see Fig. 6).

Fit fabric as described over the co-driver's machine gun as Fig. 26.

NOTE.—First lock the gun in position, if a lock is provided. If a ring or press fastener studs surrounds the gun as Fig. 21, a bridge of Pressure Plastic must be built up where the fabric crosses the ring.



Fig. 23.
Fabric on forward hull ventilator.



Fig. 24.
Fabric on rear hull ventilator.

 Fabric

TURRET SEALING

Material required :

Fabric covers.

Bostik Cleaner.

Asbestos Compound.

Bostik C.

W.D. Pressure Plastic.

To reach the turret ring at the rear of the turret, it is necessary to proceed as follows :—

- (i) Open top engine compartment doors.
- (ii) Detach the rear section of turret ring guard, by removing five bolts.
- (iii) Slide the guard, with air deflector plate attached, rearwards.

Seal the turret ring by packing it with A.C. Plug the slot in the forward edge of the turret ring guard seating, using W.D. Pressure Plastic, then lay a bead of A.C. all along the seating and replace the guard.

Bring the end of the wiring harness up through one engine door. Close and lock the doors. See that the turret is at 12 o'clock and lock it firmly in this position.

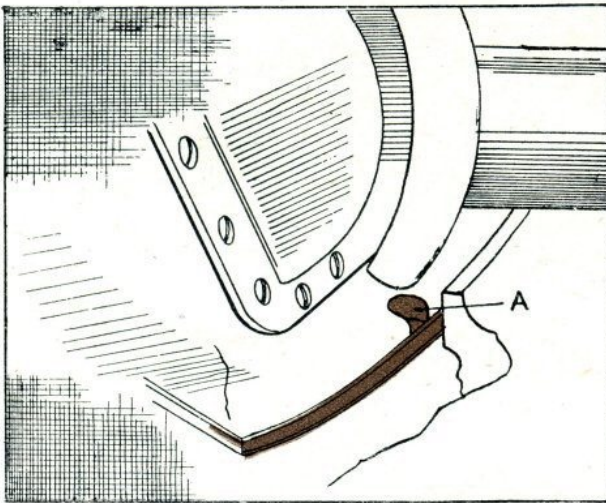


Fig. 25.
Sealing turret ring.

Now proceed to fit the fabric covers :—

Outer Mantlet

If the vehicle has the large type outer mantlet replace the co-axial machine gun, and complete the fitting of wiring harness.

Run the flex up the wall of the turret basket and across the front of the turret above the 75 mm. gun. Thread a piece of stiff wire through the space to the right of the telescope mounting, and through the aperture in the mantlet, to the outside. Attach the flex to it and pull through to the outside. Stuff the telescope mounting with waste to prevent injury from blast.

Securely attach the flex to the detonator leads, and bind the joint with insulating tape.

When fitting Cordtex to turret with small mantlet, layout as instructed above, but attach to the inner mantlet.

Complete instructions detailed in (a) to (g) below.

- (a) If the vehicle has a small, or large outer mantlet, the same fabric bag is used for sealing.
- (b) Make sure the 75 mm. gun is securely locked in position.
- (c) Paint a 2 in. band of Bostik C on the turret face around the edge of the front face of the inner mantlet.
- (d) Paint a 2 in. band of Bostik C around the 75 mm. gun barrel, just ahead of the loop of Cordtex. Be careful not to get Bostik on the Cordtex.

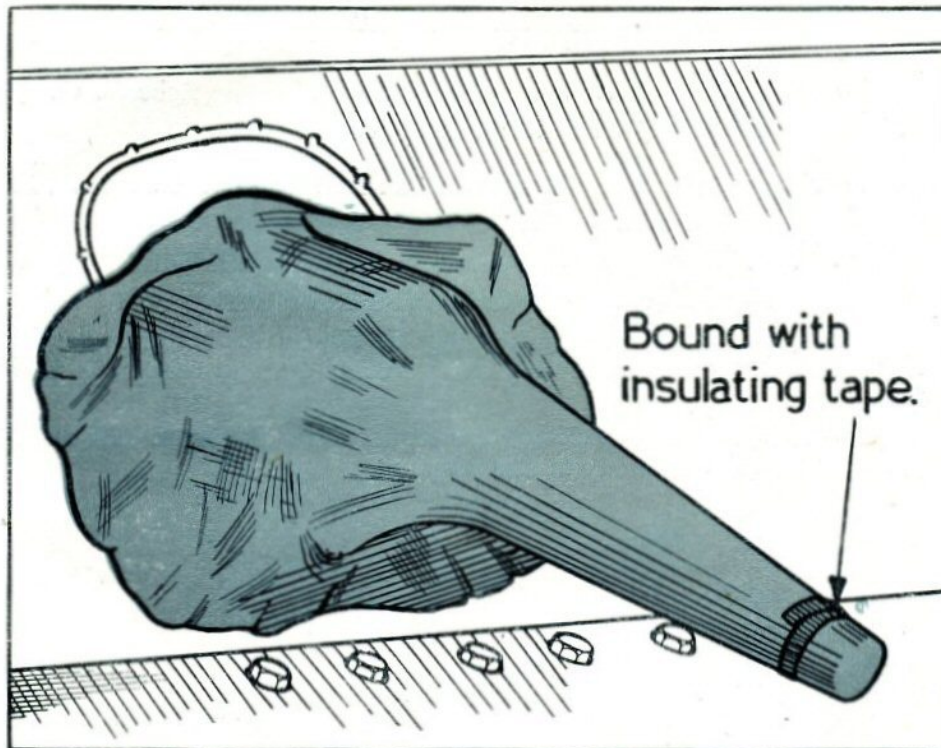


Fig. 26. Fabric over co-driver's machine gun.

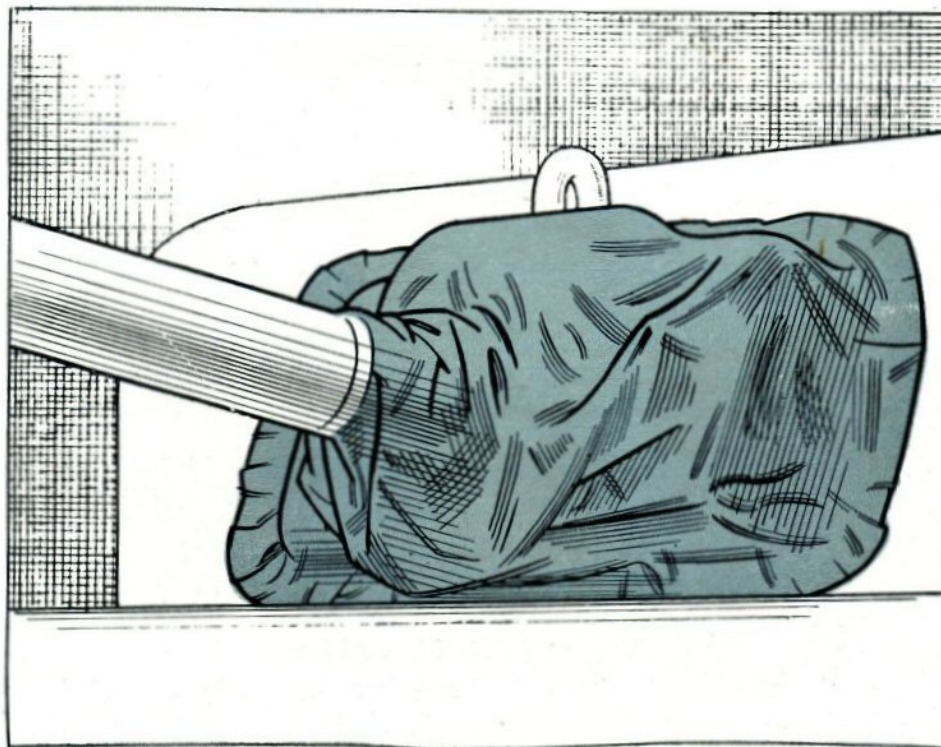


Fig. 27. Fabric on turret.

Fabric

(e) Paint a 2 in. band of Bostik C along all edges of the fabric bag. If the bag is "doped" fabric, the Bostik must be painted on the undoped side.

(f) When the Bostik C is nearly dry, affix the bag in place. Smooth over any excess Bostik C exuding from the edges and be sure the fabric is properly stuck down along the top edge where it crosses the lifting eyes.

(g) Offer up the 75 mm. muzzle cover, and, marking its outline on the barrel, attach it with Bostik C as above. Finally, paint a 4 in. band of Bostik C along the edges of both fabric base and muzzle covers, and the 75 mm. barrel. Cut the 48 in. $\times$ 3 in. strip of fabric in halves, and painting the rough side with Bostik C, wrap one piece round the edge of the 75 mm. muzzle cover and the other piece around the barrel and edge of the base cover.

Using Asbestos Compound, completely seal the turret ring (see Fig. 23). Press the compound into the gap between the turret and ring, and using more A.C. continue this sealing right round the turret. Completely fill with A.C. the gap marked "A" in Fig. 23.

FITTING AIR DUCTS—Rehearsal Only

Material required :

- Air inlet duct base.
- Air inlet and exit ducts.
- Straining rods with turnbuckles.
- Link rod.
- T bolts and hook bolts.
- Release gear with attachment bolts.
- Asbestos Compound.
- Bostik A.A.
- Bostik Cleaner.

Bolt the release gear (Fig. 29) to the bracket provided on top of the turret (see Fig. 18).

NOTE.—If the release gear has to be dismantled for any purpose, be sure that the same parts go back to the original assembly.

Take the Bowden cable into the turret as follows :—

- (i) Remove the plate from beneath the turret ventilator, and push a piece of wire up from below until it projects from the outside of the ventilator.
- (ii) Disconnect the Bowden cable from the release handle, and attach it to the piece of wire. Draw the Bowden cable through the ventilator through the turret.
- (iii) Reconnect the Bowden cable to the release handle, and hook the handle to the stay rod on the roof of the turret. **DO NOT HOOK THE HANDLE TO ANY OF THE SCREENED ELECTRIC CABLES.**

Place the air inlet duct base in position over the top engine compartment doors. Figs. 1 and 2.

Bring the wiring harness up through the grille, and attach it to the grille, using insulating tape or iron wire.

Secure the air inlet duct base by means of the hook bolts, and the staples welded to the hull for this purpose. If after tightening the bolts, the threaded portion of the two rear bolts project more than $\frac{3}{4}$ in. above the nuts, they must be cut off with a hacksaw flush with the nuts.

Carefully seal all round the joint of the duct base to the hull, with an adequate fillet of Asbestos Compound.

Fixing of reinforcing brackets and back plates for the T bolt lugs on air exit chute (where applicable).

- (1) Position each reinforcing bracket and press down firmly on lugs.
- (2) Mark bolt holes to dimensions shown on Fig. 28.

- (3) Drill bolt holes.
- (4) Fix brackets with bolts, back plates, spring washers and nuts provided. From inside the air exit chute, pass bolts through each plate and holes drilled at (3) above.
- (5) The following additional parts are required :—

Reinforcing bracket	..	..	..	..	..	..	3
Back Plate	..	..	..	..	..	..	3
Bolt, hex. $\frac{3}{8}$ in. B.S.F. $\times \frac{3}{4}$ in. long	..	..	..	..	..	..	6
Nut, hex. $\frac{3}{8}$ in. B.S.F.	..	..	..	..	..	..	6
Washer, spring $\frac{3}{8}$ in. dia.	..	..	..	..	..	..	6

Fit a T bolt into each lug on both the air inlet duct and the air exit duct. Each bolt should be fitted with the T downwards, and with a nut screwed on one or two threads only.

Stand the air inlet duct and the air exit duct in position, and slip the heads of the T bolts into the slotted lugs on the air inlet duct base, and the air exit chute.

Lightly tighten each T bolt. Attach the correct straining rod to each duct. Remove the release plate from the release gear (see Fig. 29) by operating the handle. Hold the plate while the handle is depressed, so that the plate will not fly off. Put the straining rods over the release gear peg, and replace the release plate and tongue, so that the straining rods are held.

There is an alternative method of securing the ducts. T bolt lugs and associated equipment have been modified.

NOTE.—The strainer rods must be assembled so that the front ends lie flat with the exit duct rod on top. The links at the ends of the rods provide for discrepancies in length, and the correct links for attachment to the hook on the duct must be selected.

Tighten the T bolts enough to slightly compress the jointing along the rear flange of each duct.

Now take up turnbuckles of each straining rod just enough to bring each duct on to an even seating. Then, alternately, tighten up T bolts and turnbuckles a little at a time, keeping the ducts on an even seating until the jointing is compressed about $\frac{1}{8}$ in.

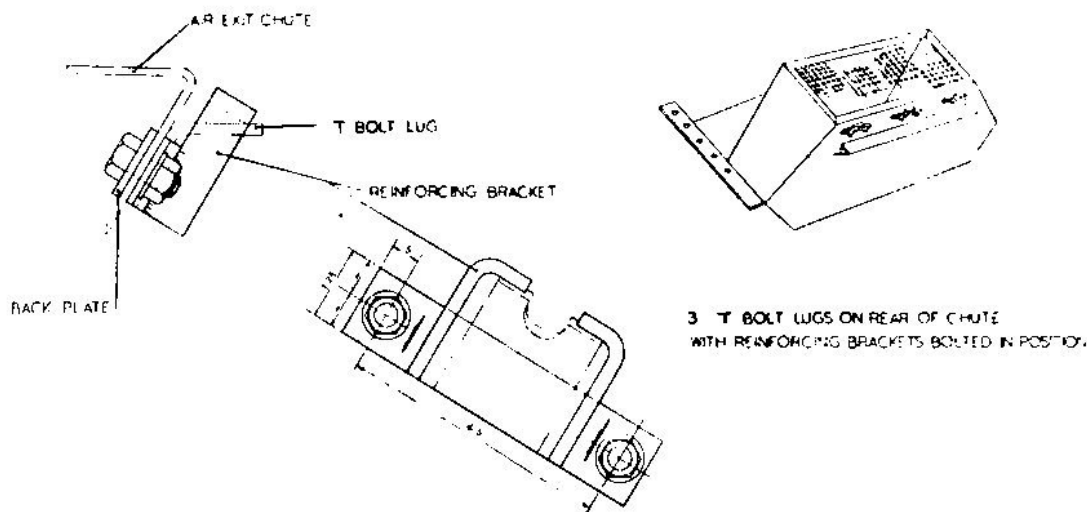


Fig. 28. Reinforcing brackets for T bolt lugs.

Check release gear for Operation

As a precaution against its loss, loosely attach with string the release tongue to a convenient point on the turret. Stand by to prevent the ducts falling to the ground, and operate the release gear.

Probably, if the vehicle is stationary, the ducts will not fall, but so long as the straining rods spring off the release gear peg, operation can be passed as satisfactory.

When satisfied with working of the release gear, re-pack all loose parts of the gear, dismantle, and re-pack the straining and link rods.

Paint with Bostik A.A. all welded seams of both ducts. Check that the vehicle number is clearly painted on both ducts.

Make ready all hardware for transit. See that all nuts and bolts are oiled, so that re-erection of the ducts will be easy.

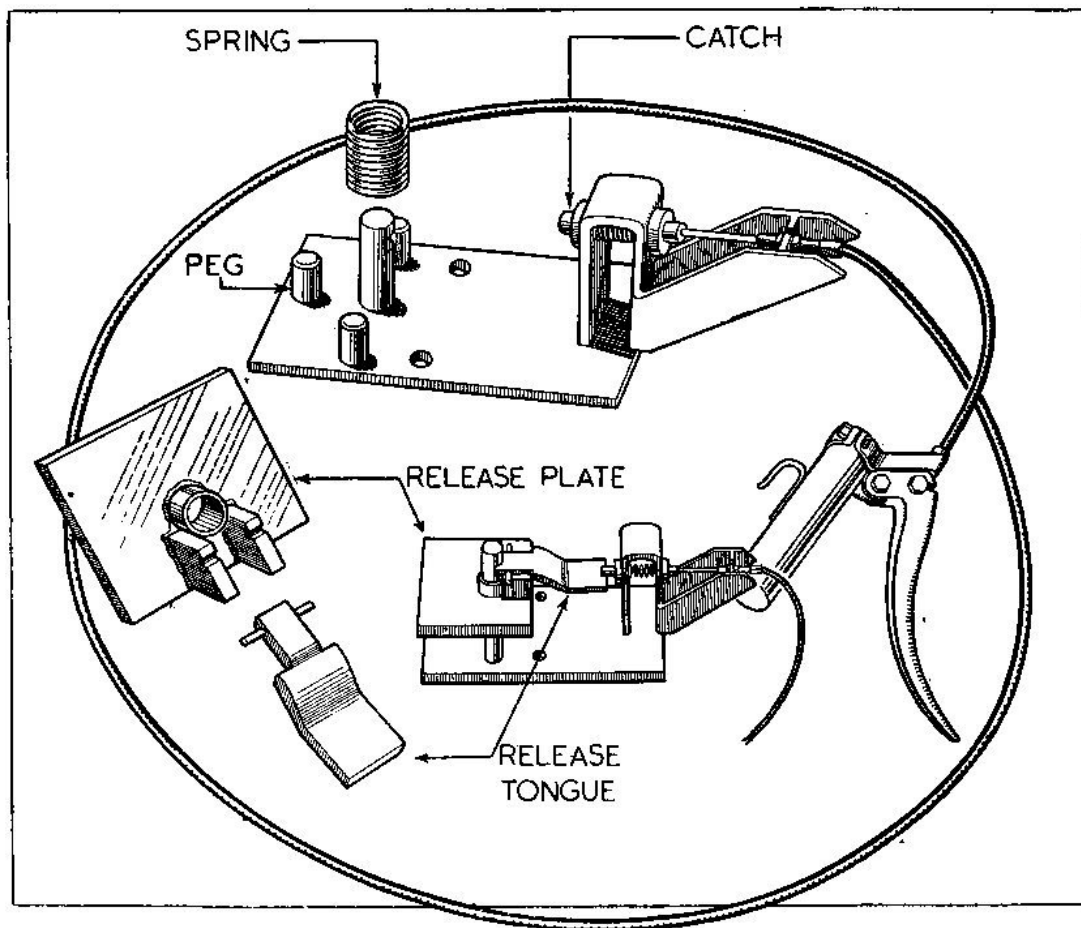


Fig. 29. Release gear

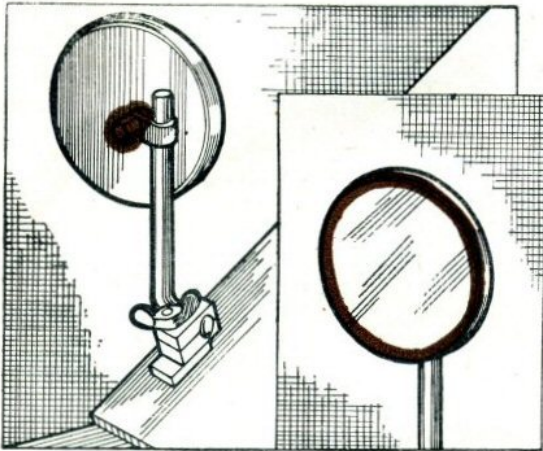


Fig. 30. Driving mirror.

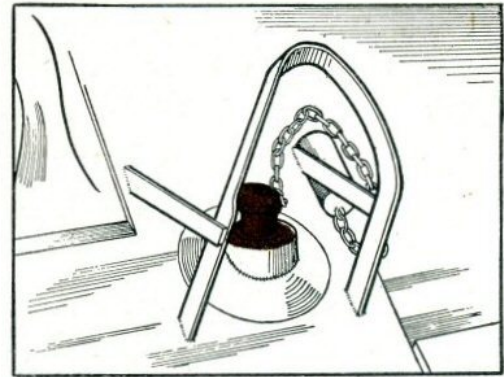


Fig. 31. Sealing headlamp mountings.

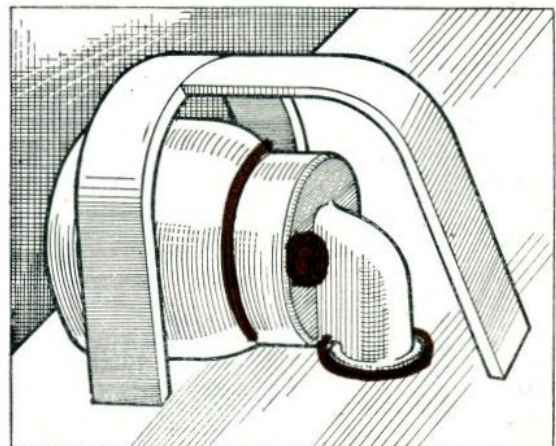
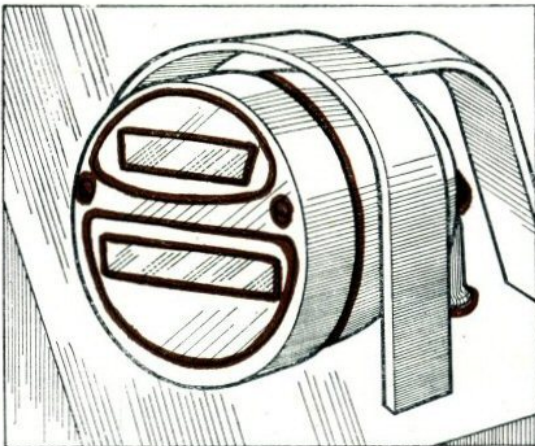


Fig. 32. Rear lamps.

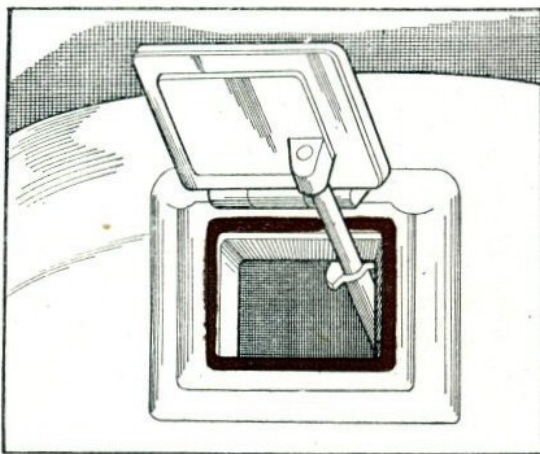
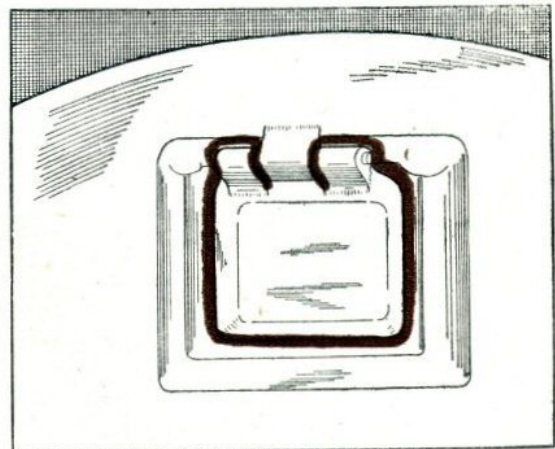


Fig. 33. Revolver port.



Asbestos Compound



COMPLETION OF UPPER HULL SEALING

1. W.D. Pressure Plastic

Using plastic :

- (a) Plug any drain holes in the turret ring guard adjacent to the rear hull ventilator.
- (b) Plug any gaps over $\frac{1}{8}$ in. wide around the spare aerial base plate (by the co-driver's hatch).

2. Bostik A.A.

Paint Bostik A.A. over every seam, welded or otherwise, and every bolt head on the upper hull.

Seal around the spare aerial base plate, covering any plastic sealing already applied.

Seal around each sponson cover plate (by the rear lamps) and the plate attachment bolt, by painting with Bostik A.A.

3. Asbestos Compound, etc.

Using A.C. :

- (a) Smear over all fixings and seams of the driving mirror. Fig. 30.
- (b) Remove each headlamp, place a bead of A.C. around mounting and plug, Fig. 31. Insert plug and smooth A.C. around joint.
- (c) Smear over all fixings and seams of the rear lamps. Fig. 32.
- (d) Open revolver port and lay a bead of A.C. on its seating, particularly under the hinge, then close and lock the port. Fig. 33.
- (e) Smoke generators, if fitted. Smear leads and terminals with A.C. and refit generators in their boxes. Cover the end cap of each generator where the leads come from it.
- (f) Smoke Discharge (if fitted to outside of turret). Smear over all mechanism with grease G.S. Check fitting of muzzle cover, and seal joint of cover to barrel with A.C.

**Paint over all
A.C. sealing with
Bostik A.A.**

TEST SEALING

Check sealing by driving the vehicle into 3 ft. of water. Watch carefully for any sign of leaks ; mark any spots where these occur, and, after leaving the water, re-seal as necessary.

A 3 ft. test has been found sufficient check on sealing even for a vehicle to be waded to 6 ft., provided the crew have done their job.

After completion of Stage 1, the vehicle must not be driven more than 100 miles.

Fig. 34.
Cordtex
on
inlet
grille.

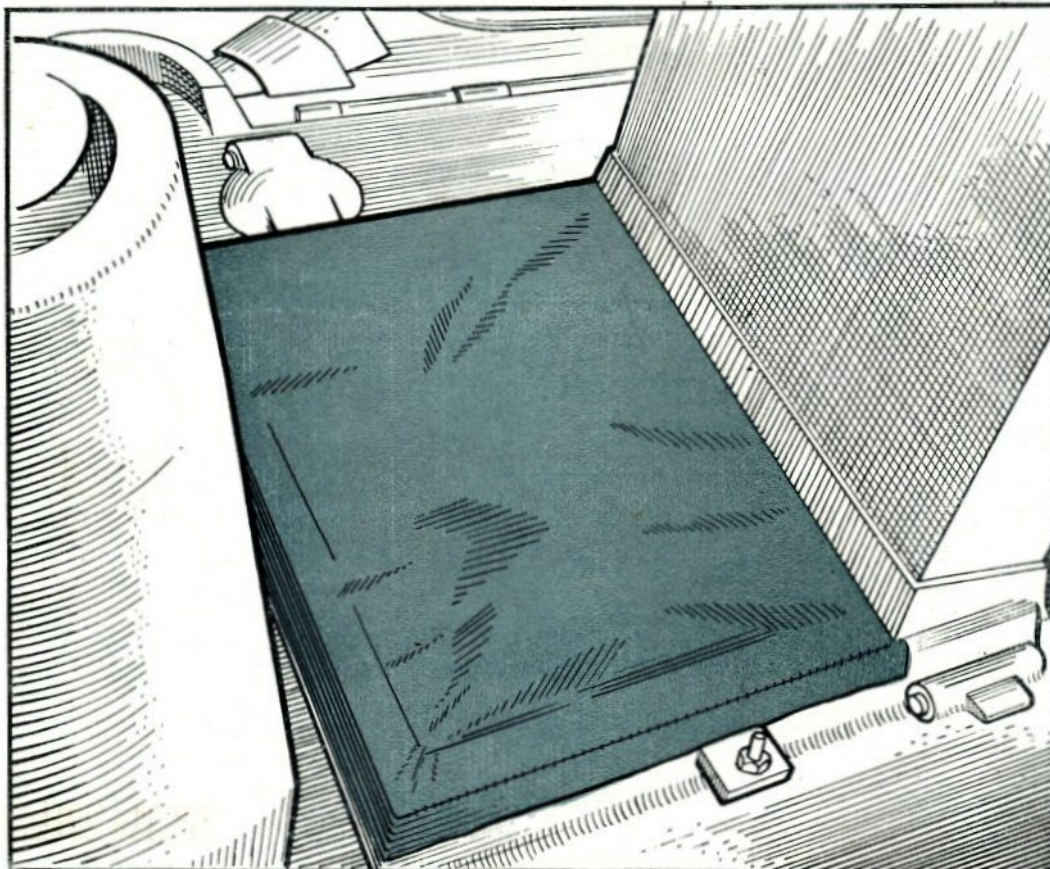
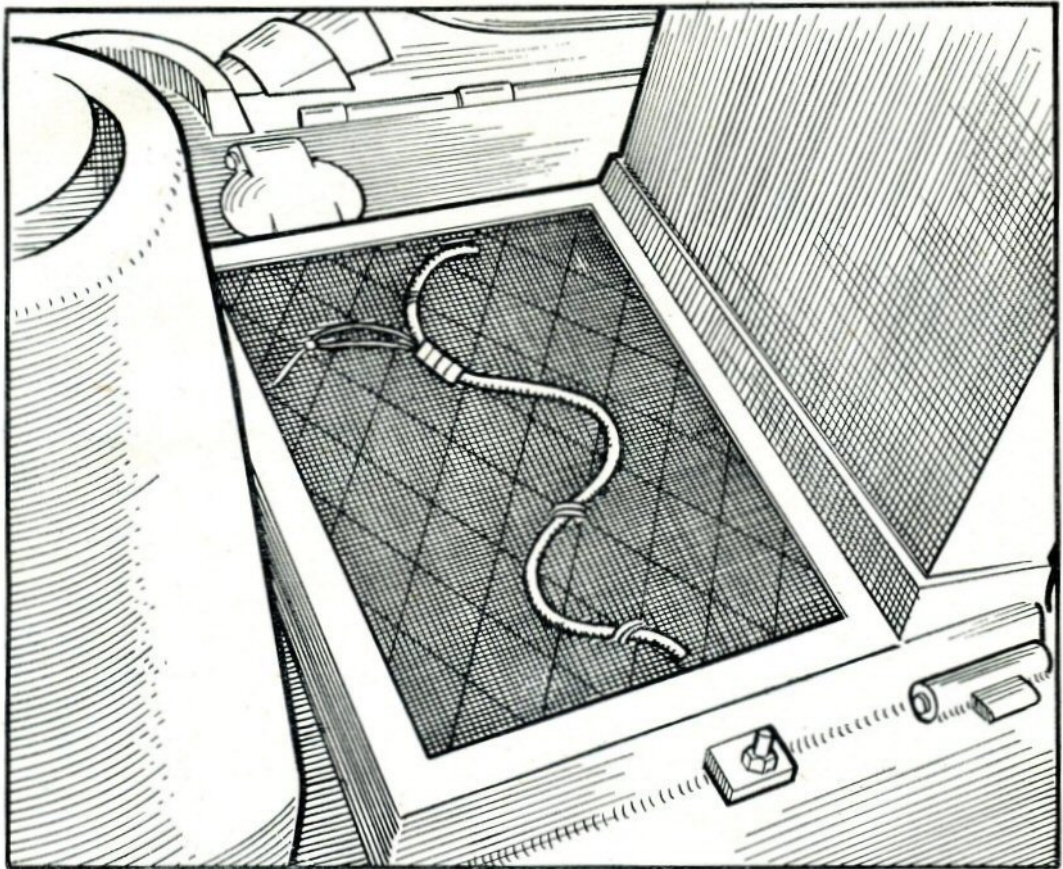


Fig. 35.
Fabric
on inlet
grille.

Fabric



STAGE 2

WORK TO BE CARRIED OUT IN ASSEMBLY OR MARSHALLING AREA

After completion of Stage 2, the vehicle must not be driven more than 20 miles

1. Check fuel, oil, and radiator water, and replenish as necessary. *Take great care not to spill any fuel or oil.* Fuel oil will destroy Bostik sealing.

Grease threads of filler caps with Grease G.S. before replacing.

2. Fit Cordtex to air inlet grille as Fig. 34, attaching it with 20 S.W.G. iron wire. Remove insulating tape from wiring harness. Connect detonator and re-bind with insulating tape.

3. Seal grille by fabric cover. Fig. 35.

To attach fabric, paint Bostik C around the grille frame. Paint a 2 in. band of Bostik C around the edge of fabric, on the undoped side. When the Bostik C is nearly dry, press the fabric in place, making sure that it is attached effectively at all corners.

4. Using A.C., seal the fire extinguisher handles (see Fig. 36). Carefully pull out each handle $\frac{1}{2}$ in. or so, and pack A.C. into the handle tube. Replace each handle and smear compound around the outside.

5. Using A.C., seal the filler cap covers as Fig. 37. Open each cover and smear its bottom edge with A.C. Close the cover and smear compound around the outside, particularly at the hinge and the locking pin.

6. Using A.C., seal the driver's and co-driver's vizors, if fitted. Open each vizor and lay a bead of A.C. around vision slit. (see Fig. 38). Be careful not to obscure the slit. Close vizor and seal around the outside of the vizor cover and over the hinge (again see Fig. 38).

7. Using A.C. and lanolin, seal the driver's and co-driver's periscopes.

NOTE.—There may be one or two periscopes for driver and co-driver, according to the vehicle type. The method of sealing is identical. Fix periscopes in required position, as after sealing they must not be moved.

Remove the periscope and smear lanolin inside and around the top of its housing, as Fig. 39. Replace the periscope and smooth the lanolin around the base of the prism to fill the joint. Clean the prism and smear it with anti-dim compound. If the prism has a built-up cover, smear the joints of this cover with A.C.

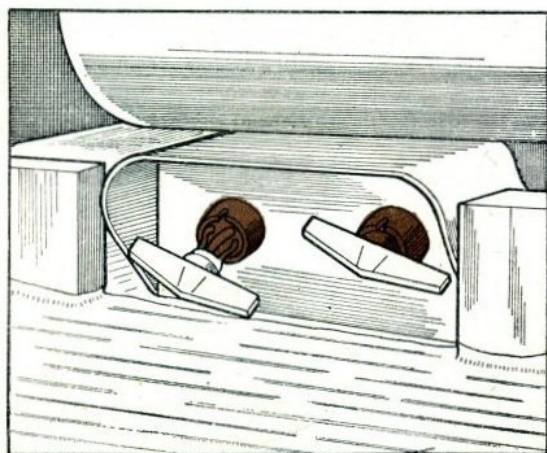


Fig. 36.
Sealing fire extinguisher handle.

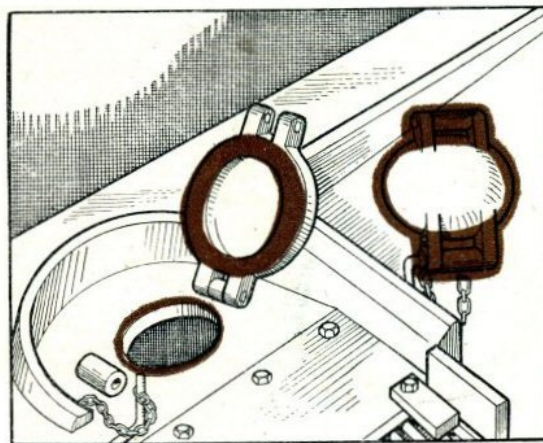


Fig. 37.
Filler cap covers.

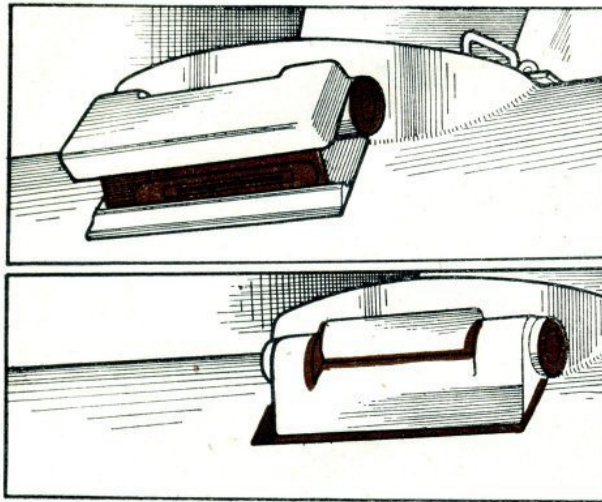


Fig. 38. Sealing vizor.

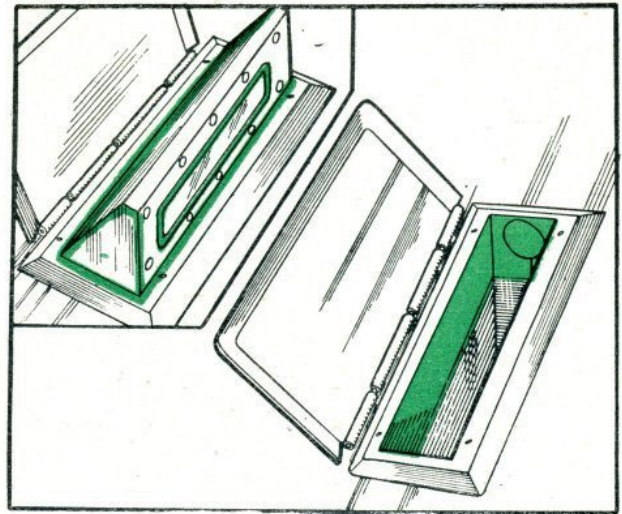


Fig. 39. Sealing periscopes.

Do not use more A.C. or lanolin than is necessary, as it may splash and obscure vision.

With the movable type periscope on the hatch, seal the barrel mounting with a liberal application of lanolin. Also seal the turntable by taking a bead of A.C. along the seam.

8. Erect the air inlet and air exit ducts as previously described for Stage 1, Page 29. Before placing the ducts in position, smear A.C. along each seating. Carefully attach and adjust straining rods as previously described. When satisfied that the ducts are correctly assembled and adjusted, cover the joint of each duct to its base with A.C. Do not seal over the lugs and T bolts as this would prevent the ducts from being jettisoned.

Use only enough A.C. to make sure of the seal.

9. Protect all tools, etc., stowed on the outside of the vehicle, by smearing them with Grease G.S.

10. Thoroughly lubricate all suspension, transmission and bogie wheels according to the requirements of the Lubricating Chart.

After completion of Stage 2, the vehicle must not be driven more than 20 miles.

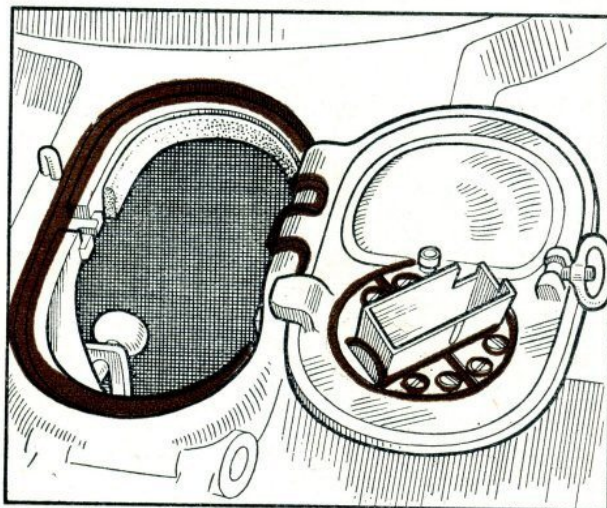


Fig. 40. Hatch sealing (open).

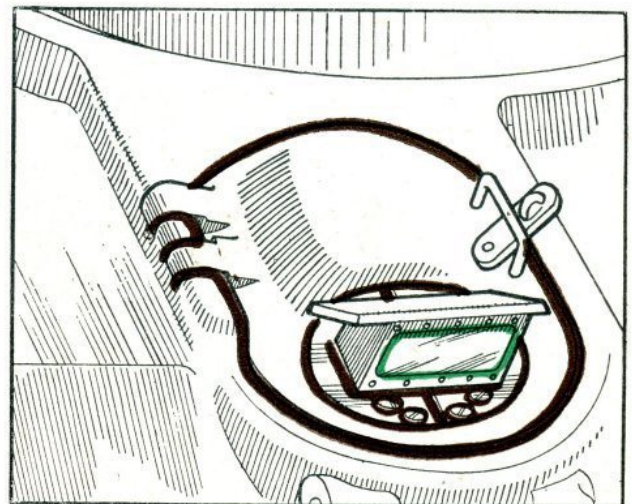


Fig. 41. Hatch sealing (closed).

 Asbestos Compound

Lanolin 

STAGE**3****PREPARATION AFTER EMBARKATION**

1. Sheet the vehicle over, if possible, during transit, to minimise damage from corrosion caused by spray or salt water.
2. Check over all sealing, particularly the sealing with Asbestos Compound. Examine for cracks in the surface of the compound and smooth over where necessary, to rectify.
3. Grease the clutch, by applying the grease gun to the two greasers in the fighting compartment.
4. Warm the engine.
5. Seal the driver's and co-driver's hatches. Each hatch can be sealed from within the vehicle, and need not be closed until the vehicle is ready to leave the craft. Lay a thick bead of A.C. along the seating for each hatch, as Fig. 40, particularly beneath the hinge. Then, close and lock each hatch. There should be enough A.C. to exude round the hatch as Fig. 41, and if convenient this may be smoothed down by some person outside the vehicle. After hatch sealing is completed, unlock each hatch and tie back the catch so that it cannot re-engage accidentally.
6. Prepare armament for action.

NOTE.—This should be done at the last practicable moment.

Remove oily rag from chamber.

Extract the lanyard or pull-through, by pulling smartly from the breech end of each gun.

Dry clean the chamber, using a piece of rag wrapped around the hand for the 75 mm., and a chamber stick for the machine guns.

7. Remove the tape from the wiring harness plug, to make it ready for use. This must not be done until just before leaving the craft.

Leave the craft carefully, to avoid excessive bow wave when entering water, but keep the engines revs. up, and keep going at all costs, so as not to obstruct following vehicles.

The driver must beware of a tendency to skid on the ramp. To avoid this, approach the point of balance slowly and square on. Once over the point of balance, **do not attempt to brake or steer.**

REMEMBER it's a steep drop into the water, so hold tight.

STAGE**4****ACTION TO BE TAKEN IMMEDIATELY ON LANDING**

As soon as the tank commander is certain not more than 3 ft. of water will be encountered again, prepare for action thus :—

Operate air inlet and exit duct release gear, to jettison ducts.

Plug in wiring harness, to blow off sealing fabrics. Immediately the Cordtex has exploded, remove the plug from the instrument panel socket.

Pull the wiring harness back into the hull to remove it from the barrel guard of machine guns.

The turret may now be traversed. When first traversing turret, do not use the power traverse, but work by hand until freedom of movement is obtained.

Remove 75 mm. muzzle cover by firing an A.P. or smoke shell.

Before firing the 2 in. Bombthrower, clear the bore by pushing out the cotton waste plug.

H.E. must not be fired until the cover has been destroyed.

If any water is in the vehicle, open a dump valve to allow it to drain out.

Remove cotton waste from ventilators as soon as possible.

**STAGE
5****MAINTENANCE AT THE FIRST OPPORTUNITY AFTER LANDING**

Remove air exit chute.

Check that all water has been drained from the hull.

Carry out weapon maintenance and full lubrication of vehicle to Lubrication Chart. Include draining and refilling of final drive and transmission casing if oil shows signs of dilution.

Remove the rear towing shackles from the lashing eye plates and refit in the towing eyes.

**STAGE
6****REMOVAL OF SPECIAL FITTINGS AFTER LANDING**

(Carry out in conjunction with Stage 5 if possible)

Remove all remains of fabric and grease sealing on hull.

Remove and discard remains of wiring harness.

Replace dust deflector, if one was fitted to the vehicle originally.

Replace external stowage bins, if originally fitted.

NOTES

NOTES

Vehicle No.

TASK CARD (Sherman III)

Page	Fig. No.	Item	Initialed on Completion
		Stage 1	
12 & 13		Preliminary maintenance	
14		Bolt or rivet holes in hull bottom, side plates, and sponson floors	
14	8	Transverse channels	
15	9	Idler brackets	
15	10	Drain holes in sponson floor	
16	11	Transmission casing to hull joint	
16	11	Transmission casing to vertical joints, etc.	
17	12	Bottom plate—bolts and screw heads, welded seams	
16	9 & 13	Bogie and idler brackets	
16	20	Access plates	
17	12	Bottom plate, dump valves, escape hatch, etc.	
19	16	Electric horn	
19		Sandshields and tracks	
21	1, 17 & 18	Air exit chute	
23		Armament maintenance	
23	19	Wiring harness	
25	20-22	Cordtex	
26	23 & 24	Fabric over ventilators	
27	25	Turret ring sealing	
27-29		Mantlet—Cordtex and fabric bag	
29-31		Air ducts, release gear, straining rods, etc.	
33		Drain holes in turret ring guard	
33		Gap over $\frac{1}{8}$ in. wide around spare aerial base plate	
33		Every seam, bolt head, etc. on upper hull	
33		Sponson cover plates	
33	30	Driving mirror	
33	32	Headlamp	
33	32	Rear lamps	
33	33	Revolver port	
33		Smoke generators, (if fitted)	
33		Smoke discharge (if fitted to outside of turret)	
		Stage 2	
35		Fuel, oil, and radiator water	
35	34	Cordtex to air inlet grille	
35	35	Air inlet grille fabric cover	
35	36	Fire extinguisher handles	
35	37	Filler cap covers	
35	38	Driver's and co-driver's vizors	
35	39	Driver's and co-driver's periscopes	
36		Air inlet and air exit ducts	
36		Tools, etc. stowed on outside of vehicle	
36		Lubrication	
		Stage 3	
37		Clutch greasing	
37		Warming the engine	
37	40 & 41	Driver's and co-driver's hatches	
37		Preparing armament for action	
37		Wiring harness plug	

R E S T R I C T E D

6-FT. WADING INSTRUCTIONS

FOR

SHERMAN III (Med. M.4.A.2.)

--oOo--

Chilwell Catalogue No.72/571

Amendment No.2

May, 1944

Page 13

Insert immediately above "Fully restow the vehicle internally" -

" INFANTRY TELEPHONE

Disconnect the Infantry Telephone by removing the Flexible Cord and Socket from the Flexible Cord and Plug in the centre of the roof of the Driving Compartment.

Open Container on left-hand side of Rear Plate, detach flexible cord of Hand Microphone from socket on Junction Distribution Box No.3 by withdrawing plug. Stow Hand Microphone inside vehicle.

Unscrew the two (captive) screws in the centre of Junction Distribution Box No.3 (which fix it to its base). Take off the Junction Distribution Box, turn it over so that the connections of the 5 leads from the conduit from the interior of the vehicle can be seen. Detach the ends of these leads by removing their terminal screws in the Junction Distribution Box. Replace the screws, screwing right home so that they will not get shaken out.

The 5 wires are identified by coloured sleeves on their ends, or by a coloured strand in their wrapping, or both. The Terminal screws in the Junction box are marked as below, together with the colour of the corresponding wire.

S I G	White	MIC + Blue
L T 12	Red	MIC - Black
SPEECH	Green	(EARTH No wire)

(1)

/If

INFANTRY TELEPHONES - contd.

If any doubt is felt about the identification of the wires for subsequent re-connection, they should be distinguished by small pieces of paper, suitably marked, and attached to the wire with insulating tape. Withdraw the wires from the Junction Box, leaving the rubber grommet in place, and replace the Junction Box.

Remove the backnut on the elbow at the end of the conduit, enabling the latter, with the wires, to be disconnected from the Container. Replace the backnut and screw up tight. Wrap the exposed terminal ends of each of the wires with insulating tape, then wrap all five together and continue the wrapping over the open end of the elbow.

Tie loose end of conduit, with wire or cord if available, or with insulating tape, to the protection grille behind the rear plate of the vehicle, as far to the left as possible. "

Insert immediately above "Test Sealing" :-

" INFANTRY TELEPHONES

Cover the drain holes in the bottom of the Container on the left-hand side of rear plate with small pieces of fabric, (about 3" square) attached with Bostik C. When dry, paint with Bostik A.A.

Cover the hole in the R.H.S. of the Container (where the conduit was attached) with a piece of fabric about 3" square, attached with Bostik C. Cover drain holes in bottom of container with patches about 2" square. When dry, paint over patches with Bostik A.A.

Seal all round margin of Lid of container with Asbestos Compound, and smear it well over the hinges. "

Insert at end of Stage 5 -

" INFANTRY TELEPHONE

Re-connect Conduit to Container. Remove Junction Distribution Box No.3 (in container in rear plate). Untape ends of 5 wires, thread through rubber grommet into Distribution Box, connect wires to correct terminal screws in junction Box.

/The

INFANTRY TELEPHONE - contd.

The 5 wires are identified by coloured sleeves on their ends, or by a coloured strand in their wrapping, or both. The Terminal screws in the Junction box are marked as below, together with the colour of the corresponding wire.

S I G	White	MIC + Blue
L T 12	Red	MIC - Black
SPEECH	Green	(EARTH No wire)

Re-fix Junction Box.

Re-connect Flexible Cord and Socket to Flexible Cord and Plug in centre of roof of driving compartment.

Re-connect Plug on cord of Hand Microphone to socket on Distribution Box, test the apparatus, and stow Microphone in Container. "